

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



**Denali National Park and Preserve
Alaska Region**

Access and Use Request, Ruth Glacier, Mountain House LLC

Environmental Assessment

May 2019



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ON THE COVER

Ruth Glacier, National Park Service photo.

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1 Proposed Action

The National Park Service (NPS) is considering issuance of a Right of Way Certificate of Access (RWCA) and a special use permit (SUP) in support of access to a 4.99 acre private parcel located on a nunatak (an isolated piece of rock protruding above a glaciated area) on the Ruth Glacier within the Alaska Range of Denali National Park and Preserve. The application for use of park lands includes activities that qualify as formal access to inholdings as provided for by the Alaska National Interest Lands Conservation Act (ANILCA). The application also requests activities that are considered special/incidental uses of NPS land that may qualify for permitting via a special use permit. See Figure 1 for the general location.

2 Purpose and Need

The purpose of this Environmental Assessment (EA) is to evaluate and respond to the formal application to construct a staircase across NPS land to access the private parcel, create two storage sites, and use helicopter transportation in support of lodge operations located on the private parcel.

NPS action is needed to respond to the request, by authorizing, or declining to authorize the requested uses. NPS action is specifically needed to ensure that any use(s) that are determined to be necessary for adequate and feasible access, as provided for in ANILCA, are identified and provided for in a RWCA. A decision is also needed in response to those actions requested but not deemed necessary for adequate and feasible access.

3 Background

Access to inholdings (private property) in Alaska National Parks is governed by the Alaska National Interest Lands Conservation Act (ANILCA) Section 1110(b), which provides that the NPS shall provide adequate and feasible access to privately owned lands that are surrounded by public land.

ANILCA Section 1110(b):

“Notwithstanding any other provisions of this Act or other law, in any case in which State owned or privately owned land... is within or effectively surrounded by one or more conservation system units... the State or private owner or occupier shall be given by the Secretary such rights as may be necessary to assure adequate and feasible access for economic and other purposes to the concerned land...”

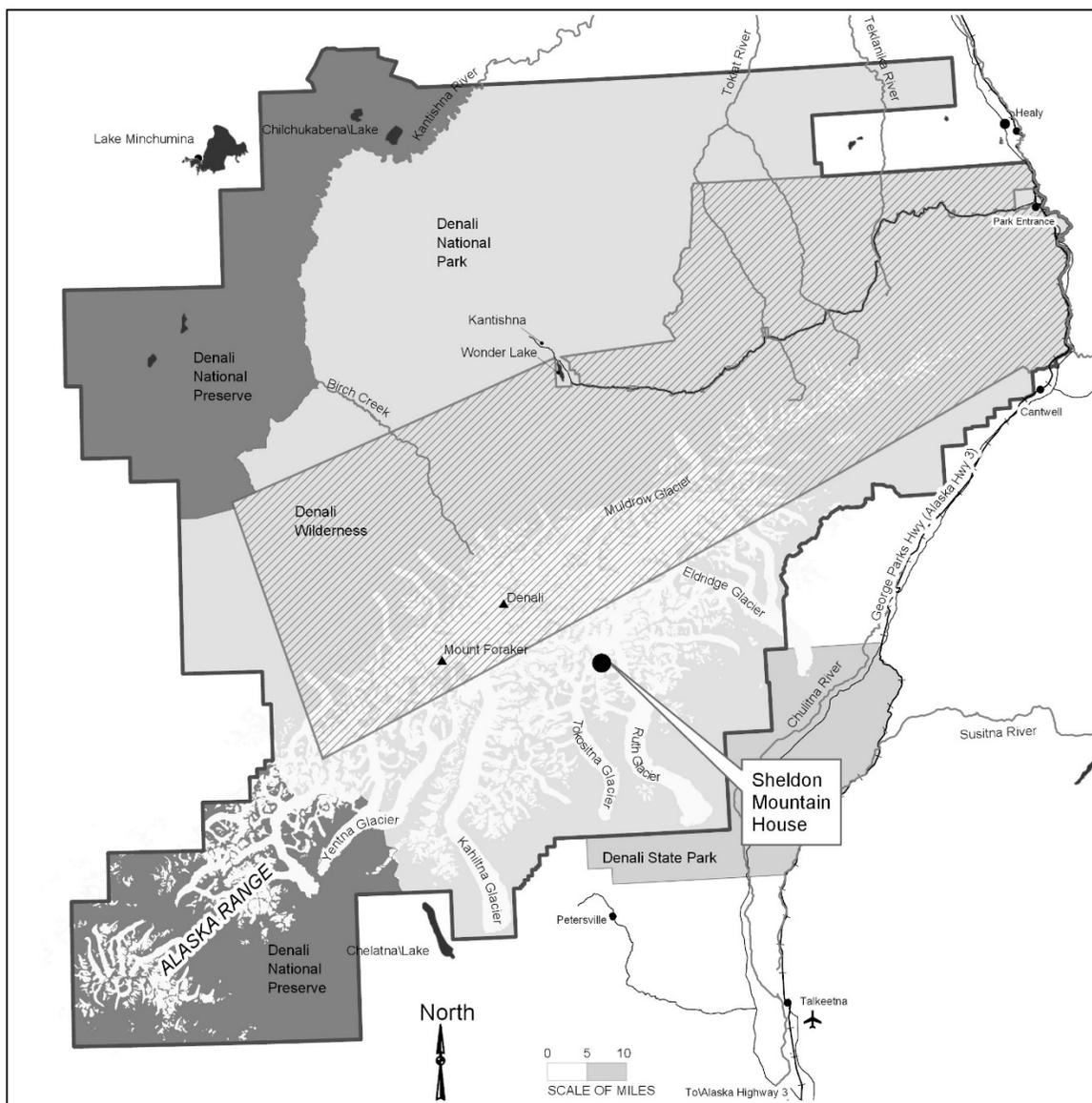
Issuing a RWCA is the NPS’s way of recognizing the legal access rights of private property owners. The RWCA describes and permits the routes to the private parcels across NPS lands, the mode of travel, and the maintenance the permittee may perform. The NPS would identify the access route, methods of access, and issue regulations governing use of the route in order to protect park resources and minimize potential impacts to park resources and values.

The NPS has discretion to issue SUPs as provided for in Reference Manual 53 (16 U.S.C. § 1; 54 USC § 100101, 103104, 100751(a)). An SUP is a written authorization of a type of “special park use.” Issuance of an SUP is not tied to formal access as defined by §1110(b) of ANILCA, however, an SUP may be issued to the landowners where no permanent changes to NPS lands are proposed or when the proposed

activities are temporary or subject to change (e.g., during construction or for non-permanent storage). An SUP is typically issued on an annual basis, with the potential for annual or biennial renewal.

This EA evaluates the environmental effects of the alternatives on the resources and values of Denali National Park and Preserve (“Denali”) in order to guide the NPS decisions about the activities and associated stipulations to authorize in response to the application for use of NPS lands.

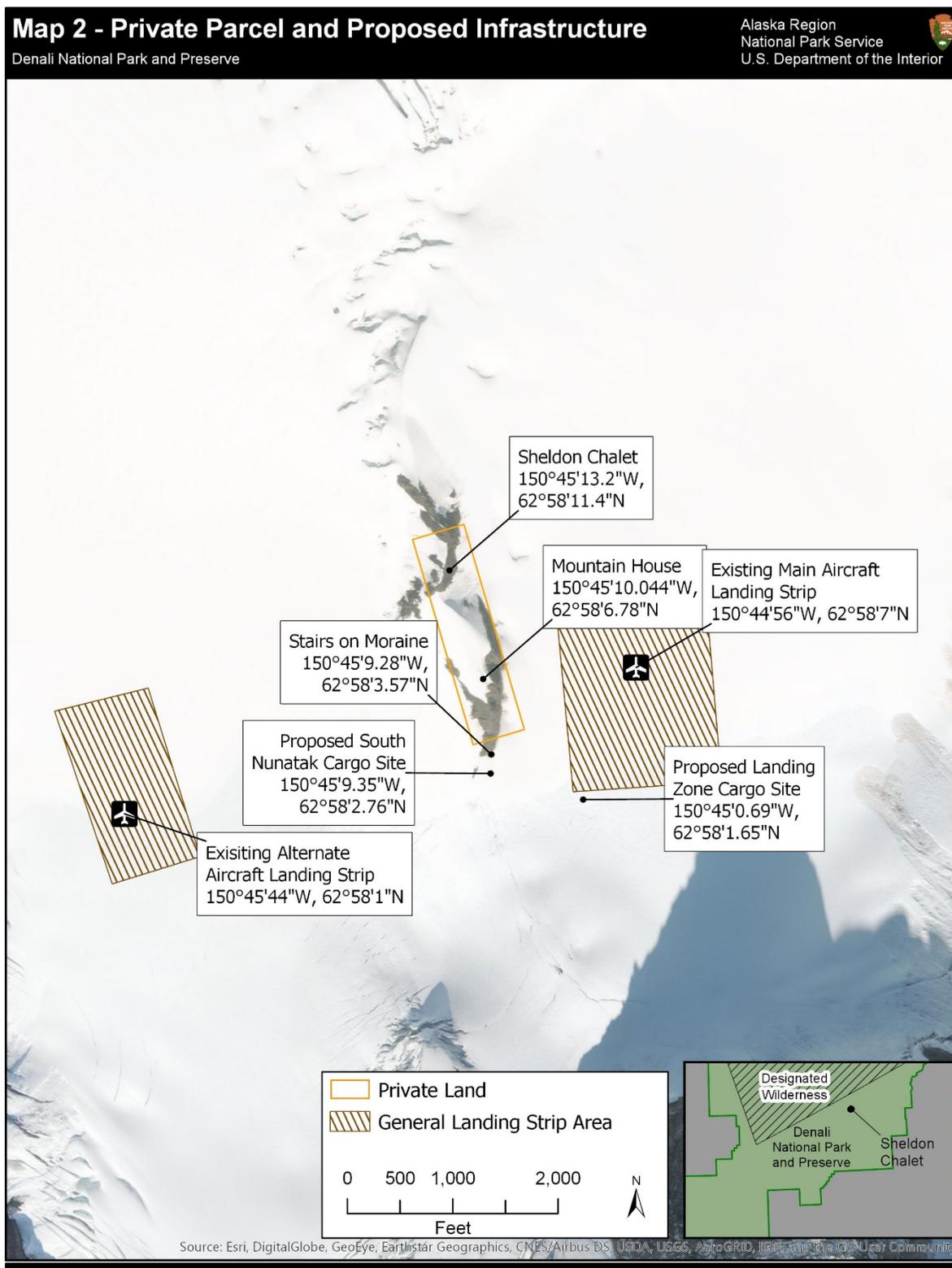
Figure 1. Location of Mountain House LLC



Location in Alaska

Figure 1
Park/Region
Denali National Park and Preserve
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Figure 2. Mountain House LLC 4.99 Acre Parcel and Proposed Infrastructure



4 Issues

Issues identified during the scoping process for this proposed project form the basis of the environmental analysis. *Acoustic Resources*, *Visitor Experience & Scenic Resources*, and *Eligible Wilderness* are analyzed in this EA. Additional issues that were considered and dismissed for cause are also described below.

Impact Topics Selected for Detailed Analysis

Acoustic Resources: Helicopter transport of cargo from NPS lands to the private parcel could impact the levels of natural sound disturbance on the Ruth Glacier.

Visitor Experience & Scenic Resources: Cargo storage on NPS lands, steps constructed on NPS lands, and transport of materials to and from NPS lands using a helicopter could change the visitor experience and visual setting on the Ruth Glacier.

Eligible Wilderness: Cargo storage, the use of helicopters for sling load operations, and the construction of a staircase on NPS land could impact wilderness eligibility and character.

Issues Considered but Dismissed or Addressed within other Impact Topics

The following issues were identified, considered, and either dismissed from further analysis or addressed in concert with other impact topics.

Cultural Resources: Due to the remote alpine setting of the project area, cultural resources are not anticipated to exist and a *No Potential to Cause Effect* finding has been determined with respect to section 106 of the National Historic Preservation Act.

Subsistence Use: ANILCA Section 810 requires federal agencies to evaluate the potential impacts of proposed actions on subsistence uses and needs. Federal public lands within Denali National Park, as they existed prior to December 2, 1980, are closed to ANILCA subsistence uses. Denali National Preserve and lands added to Denali National Park on December 2, 1980 are open to subsistence uses. The analysis in Appendix A concludes that none of the proposed actions would result in restriction of subsistence uses.

Additional issues including floodplains, wetlands, paleontological resources, native grave sites, air quality, local community vegetation and soils, wildlife habitat, and threatened and endangered species were dismissed from detailed analysis for one or more of the following reasons:

- The environmental impacts associated with the issue are not central to the proposal or of critical importance;
- A detailed analysis of environmental impacts related to the issue is not necessary to make a reasoned choice between alternatives;
- The environmental impacts associated with the issue are not a significant point of contention among the public or other agencies; or
- There are not potentially significant impacts to resources associated with the issue.

5 Alternatives

This section describes the No Action Alternative and two action alternatives as well as a brief description of alternatives considered but dismissed from further analysis. Two action alternatives are identified to assist the NPS and the public in evaluating the range of distinct activities being considered for permitting. A portion of the specific elements of the action alternatives (Table 1) could also be approved, dismissed, or further amended in the final decision by the NPS. The analysis of impacts from these alternatives as well as mitigation measures related to each proposed activity is detailed in section 7 of the EA, under *Impacts Analysis*.

Alternatives Considered but Dismissed

As part of the application process, the NPS and the landowner engaged in pre-application meetings to identify the need, objectives, and concerns related to the pending request for access to park lands. In conversations with the landowner, a number of possible activities were discussed and dismissed, including but not limited to helicopter transport of guests and structural solutions such as crevasse bridges. In light of other options to either fly guests directly to the private parcel by helicopter, or to arrive by fixed wing then ski or walk to the nunatak, transportation of lodge guests via helicopter from the nearby NPS landing strips to the private parcel was not requested by the property owner.

In the application for access (Standard Form 299), the property owner requested to land helicopters directly on NPS land for the transport of cargo, in addition to using helicopter sling loads, which is evaluated in this EA. Due to extensive analysis of acoustical data and visitation patterns, NPS managers concluded that helicopter landings would not be considered as part of this EA, based on the long periods of time required for helicopter landings, the associated impacts to acoustic resources and concerns about congestion and visitor safety. Please see Acoustic Resources Report, Appendix B. The acoustics data demonstrated that the time needed to land and load helicopters would push the NPS out of standard with the Denali Backcountry Management Plan (BCMP 2006) acoustic indicators by as much as 35.4% more of the time, as compared to an estimated change of 0.8% for sling load operations (which are considered as part of Alternative 2). Park managers determined that the 35.4% relative increase would constitute an unreasonable impact to park resources when weighed against the availability of multiple options for access and transport of cargo (land-based movement, direct flights to the private parcel, and sling load operations).

Alternative 1: Existing Conditions (No Action)

Under Alternative 1, neither a staircase nor storage would be permitted on NPS land. Helicopter activity requiring NPS land would not be permitted. The property owner would still be able to access the private parcel via those means otherwise allowed on NPS lands or via ANILCA 1110(a) (fixed wing flights, snow machines, foot traffic) as well as flights directly to the parcel via helicopter from areas outside of the park. Construction of stairs, other support facilities, and storage areas could still occur on private land at the discretion of the property owner.

Alternative 2: Issuance of RWCA and Special Use Permit (NPS Preferred)

Under Alternative 2, a RWCA would authorize modification and maintenance of a wooden staircase that would connect with the existing stairs and descend to a new location (see Appendix E, *Other Images*). This would support a change to the design of the existing staircase to allow lodge guests to safely descend

onto the glacier, in response to changing glacial conditions whereby the glacier is receding from the nunatak. The extension of the staircase is needed to provide adequate and feasible access from the glacier to and from the nunatak.

The modified section of the stairs would descend from the private parcel to the glacier, extending onto NPS land for approximately 35 lateral feet beyond the south end of the private parcel. The stairs would be three feet wide and would be affixed via removable metal stakes into rock. The stairs on the NPS land would be maintained such that they function safely for pedestrian passage and would be removed if no longer needed or maintained. The applicant could limit access to the stairs at the private property boundary. The NPS recognizes that the nature of the glacier is changing and additional changes to the staircase (e.g., length, location) might be necessary in the future. Small changes could be approved under the initial RWCA upon notice of and approval by the superintendent. Limits to the possible changes that could be undertaken without superintendent's approval would be included in the conditions of the RWCA. Substantial changes would require an amendment to the RWCA and could warrant additional NEPA analysis.

An SUP would permit the applicant to establish two total storage areas on the Ruth Glacier. These 15 feet x 15 feet staging areas would be identifiable to other area users by the use of wands or flagging and would be documented via written communication detailing coordinates and other identifiers. The location of the storage areas might change during the season in response to changes to the glacier and could be moved accordingly, while remaining proximal to the landing areas. Relocation of the storage areas greater than 100 feet from the approved location would require permission from the superintendent. The storage areas would each house one white storage tote and would provide for temporary storage of cargo (items in support of lodging operations) transported to/from the glacier via fixed wing aircraft. The applicant's intent is to move any cargo as quickly as possible to the private parcel, weather and logistics permitting. Staged materials could include diesel, aviation gas, propane, Jet A fuel, motor oil, and glycol in OSHA-approved containers with provisions for spill response kept on site. With the exception of the storage totes, no particular item may be stored on the glacier for more than four months (36 CFR §13.45).

An SUP would allow the applicant to transport cargo from the airstrip or the flagged storage areas to the private parcel using a helicopter sling load operation, whereby materials are transported using a heavy cable that descends from a helicopter that uses a hook to attach and transport materials (See Appendix E, *Other Images*). Helicopter sling load operations could occur year round, up to three days each week, up to ten round trips on each of those days between the private parcel and the location of the staged cargo. The NPS would set limits on the daily timing of these trips in the SUP.

The NPS has identified Alternative 2 as preferred because this alternative authorizes the modification and extension of the staircase, thereby ensuring adequate and feasible access as provided for in ANILCA, while best protecting park resources.

Alternative 3: Issuance of RWCA only (staircase)

Under Alternative 3, a RWCA would be issued for the construction of the wooden staircase on NPS land. No SUP would be issued for the establishment of storage areas nor helicopter sling load operations.

The RWCA would permit the construction and maintenance of a three-foot wide, wooden staircase, bolted to rocks on approximately 35 lateral feet of NPS land. Small changes to the staircase would require

permission from the superintendent and extensive changes might require an amendment to the RWCA, as described under Alternative 2.

Under this alternative, the applicant could still store materials for up to 24 hours without a permit, per federal regulation common to NPS lands (Title 36 § 13.45).

Table 1. Summary of Alternatives and Direct and Indirect Impacts

Action	Alternative 1: Existing Conditions (No Action)	Alternative 2: Issuance of RWCA & Special Use Permit	Alternative 3: Issuance of RWCA Only (Staircase)
Summary of Alternatives	<ul style="list-style-type: none"> ● No RWCA nor SUP issued ● No construction of stairs on NPS land ● No storage sites delineated on NPS land ● No helicopter activity permitted using NPS land ● Access available via means and methods allowed to general public and via ANILCA 1110(a) 	<ul style="list-style-type: none"> ● Two 15ft x 15ft storage areas identified and flagged (SUP) ● Helicopter transport of materials using sling load (SUP) ● RWCA issued for modification and maintenance of stairs ● Access available via means and methods allowed to general public and via ANILCA 1110(a) 	<ul style="list-style-type: none"> ● RWCA issued for modification and maintenance of stairs ● Access available via means and methods allowed to general public and via ANILCA 1110(a)
Direct and Indirect Impacts to Acoustic Resources	<ul style="list-style-type: none"> ● No permit issued for additional activity or use directly involving NPS land. 	<ul style="list-style-type: none"> ● Up to 30 additional (~4 min. each) sling load round-trip flights above park land per week ● 0.8% increase in the amount of time acoustic standards are out of compliance with BCMP for the project area 	<ul style="list-style-type: none"> ● Few impacts for acoustic resources

Action	Alternative 1: Existing Conditions (No Action)	Alternative 2: Issuance of RWCA & Special Use Permit	Alternative 3: Issuance of RWCA Only (Staircase)
Direct and Indirect Impacts to Visitor Experience & Scenic Resources	<ul style="list-style-type: none"> ● No authorization of staircase extension onto NPS land, in view of other park visitors (stairs on private land would still be visible) ● No totes or stored cargo would be visible on the glacier (temporary storage up to 24 hours as generally permitted to public still possible) ● No helicopters would be viewed sling loading cargo to/from NPS land 	<ul style="list-style-type: none"> ● A set of wooden stairs descending the nunatak built partially on NPS land, would be visible ● Totes and cargo would be visible on the glacier at 2 storage areas ● Helicopters would be viewed sling loading cargo ● Potential impacts to Visitor Experience & Scenic Resources would exist as a result of additional cargo activity & safety hazards related to aviation activity 	<ul style="list-style-type: none"> ● A set of wooden stairs descending the nunatak built partially on NPS land, would be visible ● No totes or stored cargo would be visible on the glacier (temporary storage up to 24 hours as generally permitted to public still possible) ● No helicopters would be viewed sling loading cargo to/from NPS land
Direct and Indirect Impacts to Eligible Wilderness	<ul style="list-style-type: none"> ● No general expansion of landowner's footprint (per cargo storage and staircase) permitted on NPS lands ● No authorization of staircase extension onto NPS land, which would preserve the undeveloped quality of wilderness character ● No helicopter sling load operations involving NPS land and associated acoustic impacts would occur ● Transport of cargo using methods allowed to general public and via ANILCA 1110(a) would continue 	<ul style="list-style-type: none"> ● The expansion of the footprint of the private parcel, the use of helicopters and the construction of structures to access the parcel could adversely impact the undeveloped quality of wilderness character and could hamper future potential wilderness designation ● Increased commercial development, line-of-sight impacts of modern human features, and changes to soundscape could adversely impact the solitude quality of wilderness character 	<ul style="list-style-type: none"> ● Transport of cargo using methods allowed to general public and via ANILCA 1110(a) would continue ● The construction of a staircase on NPS land could adversely impact wilderness character

6 Affected Environment

The immediate affected environment, particularly with respect to acoustic and visual resource impacts, is a broad glacial setting that includes the Don Sheldon Amphitheater below the Denali massif and at about 5,400 feet above sea level. For the purposes of this EA, the project area to be analyzed is the Ruth Major Landing Area (Figure 3; cover image), and is a sub-portion of the Ruth Special Use Area identified in the 2006 Denali BCMP. The Ruth Special Use Area encompasses glaciated areas, cliffs, and alpine terrain surrounding the Ruth Glacier. The glacier moves at speeds ranging from one inch to three feet per day (Burgess et al, 2013).

The private parcel is located in eligible wilderness in the ANILCA park additions, or “new park”, within the Ruth Special Use area, an area managed for high visitor use and fixed wing aviation-based access. The project area is delineated by the Ruth Major Landing Area (Figure 3); a designation that provides for high use of transportation and permits “very high” natural sound disturbance. Other management criteria for the area allow “high” rates of encounters with other visitors as well as landscape modifications (Table 1, BCMP). ANILCA allows visitors using air tour operators, private pilots, as well as the private property owner access to the area via fixed wing aircraft; other forms of travel approved in ANILCA are also allowed (pedestrian travel, travel by dog team, snow machines for traditional activities).

Acoustic Resources

The project area is a glaciated basin ringed by granite cliffs and alpine, snow-covered peaks. The acoustic environment of the amphitheater – as the name implies – is a reverberant, echoing space.

The natural ambient sound pressure level (L_{nat}) is defined as the amount of acoustic pressure energy in an environment without human sounds present (Lynch et al. 2011, NPS 2013). It is an important baseline from which noise impacts are measured. The observed L_{nat} in the amphitheater is approximately 28 A-weighted decibels (dBA). The peaks above may be even quieter: the observed median L_{nat} value above 6200 feet in the Alaska Range is 24 ± 3 dBA ($n = 10$ sites). Please see Appendix B for the NPS data and observations referenced in this section.

Two landing strips exist in the project area, allowing air taxi and flight seeing access from Talkeetna. Depending on glacier conditions one or both strips may be used, with most use occurring on the eastern strip. Flight time from Talkeetna is approximately 30-45 minutes using common aircraft such as the DHC-2 Beaver, DHC-3 Otter, Cessna 185, or Cessna 206. Private and agency aircraft access the area at times, but air taxi (overflights), glacier landing and flight seeing trips comprise the majority of noise impacts. Noise from administrative uses represents less than 2% of the aggregate impact to the acoustic environment (Appendix B). Aviation activity varies widely with weather and time of year. Information from NPS concession contract annual operating reports indicate that as few as zero and as many as 27 aircraft landed per day during the summer season of 2017 (NPS unpublished data).

The BCMP articulates that the area around the Ruth Glacier, “*would be managed for those visitors who want to experience the wilderness resource values or other resource values of the Denali backcountry but require services or assistance, or who are unable to make a lengthy time commitment,*” (p. 33) and further describes that the Major Landing Zone would “*provide high-use airplane landing areas that are suitable for both day use and expedition drop-off and pick-up. Seasonal, May-September*” (p. 37). With

these management goals in mind the park implemented three standards for acceptable condition of the acoustic environment in the area:

1. **Percent Time Audible:** “motorized noise may be audible up to 50% of any hour”
2. **Events Per Day:** “up to 50 motorized noise intrusions per day”
3. **Maximum Sound Pressure Level:** “motorized noise does not exceed 60 dBA”

The plan also calls for the monitoring of acoustic impacts relative to these standards. Acoustic field measurements were taken in 2002 and 2016 to assess compliance. Appendix B contains a detailed report of these measurements and standards.

Recording sites in the Ruth Major Landing Area are among the most impacted backcountry locations measured in Alaskan national parks. There was a decrease in noise between 2002 and 2016, but there is still some level of exceedance of every BCMP standard in the amphitheater and greater Ruth Glacier Area. The most recent acoustic measurements pre-date the 2017 and 2018 construction and operation of the new Sheldon Chalet and therefore do not reflect any noise associated with recent changes in the area. Data collection thus far has focused on noise disturbance during the visitor season, when most activity occurs. The winter and shoulder seasons are relatively quiet, with infrequent overflights and access occurring for winter trips, including to the Sheldon Mountain House private parcel.

Scenic Resources & Visitor Experience

The Ruth Glacier is in a visually dramatic alpine setting from which Denali, the highest point in North America, can be viewed. During the winter months, dark night skies allow possible views of the aurora borealis. In winter months, the glacier is typically snow covered with snow filling crevasses to some extent. Relatively limited human visitation takes place during the winter.

During the spring and summer months (April to September), visitation increases as recreationists journey to the Ruth Glacier to, among other things, camp, climb, ski, practice glacial travel skills, sightsee, and take photographs. As the summer progresses, new snow melts, crevasse hazards increase, more granite becomes visible and the “midnight sun” allows for many hours of recreation.

During the busiest of the summer months (June and July), many visitors fly in and out via fixed wing airplanes to the Ruth Glacier. Commercial glacier landing air tour operators taxi visitors one-way to commence or complete trips. Commercial air tour operators also offer scenic tour services which can include a stop and walk on the glacier. Privately-owned airplanes also access the area. The NPS reports anecdotal and field observations between 5 and 25 landings daily during the busy season, as corroborated by the 2017 unpublished data cited previously.

In addition to first-hand observations, the NPS collects data from commercial operators. An analysis was done of scenic air tour operation and passenger data collected from the period 2013-2018 for the south side of the Alaska Range (NPS unpublished data). The data analysis distinguishes activities on the Ruth Glacier, where the majority of flightseeing operations occur, from other destinations in the Alaska Range. Some notable findings are that for the past six years, flight seeing has grown overall, but not in a strong or consistent linear trend. Between 2013 and 2018, scenic flights brought 114,226 recorded visitors to the Ruth Glacier area, where visitors typically spend 20 minutes and travel within an area that is approximately 322 square feet (30 square meters), proximal to the landing strip(s). In 2018, for example,

19,032 visitors arrived on glacier landing scenic air tours at one of the Ruth landing strips, but this number only reflects glacier landing scenic air tour landings and does not reflect the number of visitors using glacier landing air taxi services.

In addition to the natural landscape in the project area, visitors also see airborne as well as parked aircraft in the amphitheater, small amounts of temporarily stored materials, and visitors engaged in recreation. The buildings visible on the Ruth Glacier are all located on the private parcel and include the Sheldon Mountain House (a 200 square foot, hexagonal structure with a 300-foot staircase and a few support buildings, built 1966) and as of 2018, the Sheldon Chalet (a 2,000 square foot, two-story hexagonal structure with support buildings and located approximately 850 feet north of the Mountain House).

The amphitheater is a unique location in Denali, both for its aesthetic qualities and as a result of its unique management classification a “Major Landing Area” per the BCMP. Easily accessible for day trips, the area becomes much like a small airport on fair weather days during the summer months with frequent noise events and the observable arrival of flights arriving, departing, loading and unloading guests.

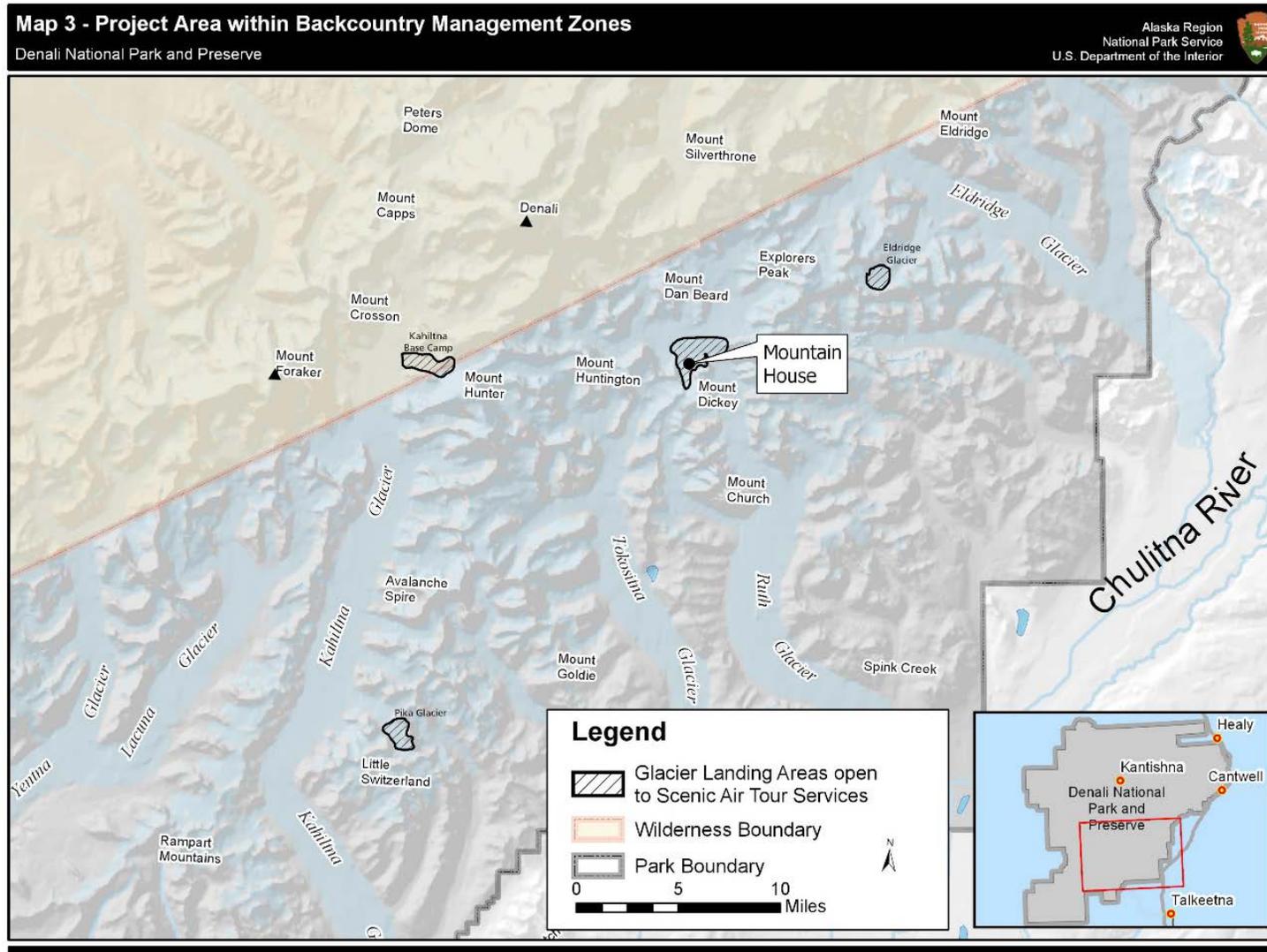
Eligible Wilderness

The project area is located in eligible wilderness, which is to be managed such that the wilderness character is preserved for potential designated wilderness status per NPS management policies and Director’s Orders 41. Eligible wilderness portions of Denali were determined in Denali’s General Management Plan (GMP) to be eligible for formal wilderness designation due to untrammeled, undeveloped, natural, and primitive (solitude) qualities (GMP, 1986).

Per the BCMP, the Ruth Major Landing Area, located in eligible wilderness and proximal to designated wilderness (Figure 3), is to be administered for those visitors who want to experience the wilderness resource values or other resource values of the Denali backcountry but require services or assistance, or who are unable to make a lengthy time commitment.

During the winter, the area is remote, relatively devoid of human activity, sound, and lights. By contrast, the solitude quality of wilderness character is heavily impacted during the summer visitor season and is out of compliance with the BCMP standard for each acoustic indicator as discussed above. Taking a broad view of the Ruth Glacier, the presence of aircraft, high encounter rates with other park visitors, the visibility of the Mountain House and Chalet infrastructure (visible from park land, although not located on NPS property), and the miscellaneous signs of human activity on the landscape, each detract from each of the qualities of wilderness. The existing conditions that describe the area’s setting and wilderness character largely reflect the descriptions found previously under Acoustic Resources and Scenic Resources & Visitor Experience.

Figure 3. Project Area defined by Ruth Major Landing Area boundaries (Hash-marked area, BCMP Map 4)



7 Impacts Analysis

Alternative 1: Existing Conditions (No Action)

Under the No Action Alternative, management of the use of NPS lands in the project area would continue in the current condition. The property owner could access the airstrip in accordance with ANILCA via fixed wing aircraft and could travel from the airstrip to the private parcel overland by foot, ski, snow machine, and means generally approved for use by the public or under Section 1110(a) of ANILCA. However, adequate and feasible access is not always present under the existing conditions because the current infrastructure (wooden staircase in present location) does not safely reach the level of the glacial ice when snow and ice levels diminish. Under these conditions, more common late in the visitor season and/or during low-snow years, the glacier is “receded” from the nunatak, eliminating feasible access from the glacier onto the nunatak.

Completion of this EA would result in no issuance of a RWCA or SUP in response to the applicant’s request for access and use of park lands for the construction of a staircase, for storage areas, or for helicopter use. This decision would not rule out subsequent requests for permits or access on a case-by-case basis, as has occurred at previous times. This decision would not preclude the property owner from helicopter use of the private helipad or from construction or storage on the private parcel.

Acoustic Resources

Direct and Indirect Impacts

The NPS is aware that the acoustic levels are out of compliance with the indicators and standards detailed in the BCMP for much of the busy summer season. By electing the No Action Alternative, the NPS would not authorize additional flights to NPS land, thus not directly permitting added sound events in the already noisy area.

In summary, selection of Alternative 1 would minimize additional impacts to the acoustic resources in the amphitheater by declining to authorize helicopter sling load operations that require the use of NPS land. Conversely, election of this alternative could result in indirect impacts owing to the potential net changes in levels of helicopter activity, resulting from increased total helicopter flights directly to the private parcel.

Under each alternative, the NPS would enhance monitoring efforts during the 2019 summer season to evaluate possible changes to aviation activity levels.

Scenic Resources & Visitor Experience

Direct and Indirect Impacts

Under the No Action Alternative, the Scenic Resources & Visitor Experience might be largely unchanged relative to current conditions, but resulting direct and indirect impacts may range from no change from current conditions to a marked increase in activities witnessed by area visitors resulting from aviation and construction activity on the private parcel. Possible impacts could result from changes in levels of snow machine to transport materials from the airstrip(s) to the private parcel, ongoing ad hoc requests by the landowner for storage of materials near the airstrip, and increased number of helicopter flights visible overhead that fly directly to the helipad located on the private parcel.

In summary, impacts to Scenic Resources & Visitor Experience might be minimized under the No Action Alternative as no stairs would descend onto NPS land, two storage areas would not be established on NPS land, and no sling load operations would take place directly involving NPS land. However, other actions taken in the area could result in a range of indirect impacts that exceed the existing levels of impacts to Scenic Resources & Visitor Experience.

Eligible Wilderness

Direct, Indirect Impacts

The No Action Alternative would not introduce direct impacts to wilderness character, including opportunities for solitude, remoteness, and undeveloped characteristics. Indirect impacts may range from no change from current conditions to potential wilderness character impacts resulting from aviation and construction activity on the private parcel. Similar to potential impacts discussed under Scenic Resources and Visitor Experience, potential impacts to wilderness character could result from increases in amount of snow machine use to transport materials from the airstrip(s) to the private parcel, ongoing ad hoc requests by the landowner for storage of materials near the airstrip, and increased number of helicopter flights directly to the helipad located on the private parcel.

In summary, impacts to Eligible Wilderness might be minimized under the No Action Alternative as additional development, storage, and sling load operations would not occur on NPS land. However, other actions taken on adjacent private land (which NPS does not have authority to regulate) could result in a range of indirect impacts to Eligible Wilderness that exceed the existing levels of impacts to wilderness character.

Alternative 2: Issuance of RWCA and Special Use Permit (NPS Preferred)

Under Alternative 2, the NPS would issue the property owner a RWCA for modification of a wooden staircase and an SUP allowing storage at two locations on NPS land and helicopter sling load transportation of cargo. These authorizations would be accompanied by conditions that are intended to protect park resources as well as provide detailed understanding of scope of the permitted activities. These conditions would be further specified in the RWCA and SUP when drafted and would be agreed upon by the NPS and the applicant. Many of the potential conditions are included here under each impact topic as part of the mitigation measures. Additional mitigation measures may develop as part of this EA to further reduce potential impacts.

Acoustic Resources

Direct and Indirect Impacts and Mitigation Measures

The BCMP acknowledges and allows for “very high” levels of motorized activity within the Ruth Major Landing Area in recognition of its unique aviation history and visitor attractions. However, current use of the area exceeds all three of the BCMP’s acoustic standards. Under Alternative 2, helicopter operations would add additional direct impacts on acoustic resources. It would do so by allowing up to ten round trip helicopter sling load flights (lasting for a total of approximately four minutes per round trip for a total of approximately 40 total minutes) up to three days each week. Authorizing this use would result in small increases in exceedance for two of the three BCMP standards. Appendix B provides detail for impact magnitude estimates.

The first expected increase is the audibility of noise – the amount of time people or animals can hear motorized human activity. The BCMP standard states that motorized noise shall not be audible for more than 30 minutes of any hour. Adding ten round trip flights three days a week during the summer months, the predicted increase due to would generate an additional +0.8% of hours to exceed the standard, for a total of 18.1% of hours out of compliance with the BCMP when all motorized activity is considered. During the winter months exceedance of the BCMP audibility standard is unlikely.

The second expected increase is in the maximum sound pressure level of noise events – a measurement similar to what a visitor would describe as “the loudest part” of an event. The current standard is that the maximum sound pressure level of a noise event does not exceed 60 A-weighted decibels. Adding ten round trip flights three days a week during the summer months would generate an additional +0.8% of noise events to exceed the standard, for a total of 41.7% of noise events out of compliance with the BCMP. During the winter months, the sling load flights would represent a larger percentage of the overall motorized use because the overall number of noise events is expected to be fewer.

Alternative 2 could also result in a range of indirect impacts for acoustic resources in the immediate area and elsewhere in Denali. One potential impact is the displacement of other businesses who operate on the Ruth Glacier. If these operators choose to take clients elsewhere, acoustic impacts in other parts of Denali could expand. Also, sound spreads over the landscape and therefore the range of impacts includes possible effects on the acoustic setting in the proximal “Old Park” (designated wilderness, where standards for acceptable acoustic events and levels are more stringent) are a possible result of sling load operations in the Ruth Glacier (Appendix E, Other Images). Conversely, with the adoption of quiet technology or other best management practices, impacts could remain the same or even diminish.

In summary, Alternative 2 would result in seasonally-dependent impacts. During the summer months, an additional +0.8% of all hours and an additional +0.8% of all noise events would be out of compliance with the BCMP; further deviation from desired future conditions in an area already heavily impacted by noise. Alternative 2 could also have indirect impacts for acoustic resources proximal to the project area as well as in locations in other parts of the Alaska Range.

If approved, the SUP for sling load operations would include stipulations that reflect the mitigation measures discussed here. These conditions would supplement the standard conditions common to all SUPs and could include additional measures for minimizing impacts based on this analysis.

The NPS intends to re-establish the acoustic monitoring site on the Ruth Glacier in 2019 to better understand current and changing flight patterns. An annual monitoring fee is not being considered for 2019, but may be required of the permit holder in subsequent years based on cost and need during 2019.

Management would use data from this monitoring to inform decisions about subsequent SUP issuance and approved use levels related to other aviation uses in the area. Park managers would analyze overall aviation activity relative to the acoustic standards for the area to inform these future decisions.

In addition to placing acoustic monitoring equipment, NPS staff would make no less than three trips to the project area during the busy season (April – July) to ground truth monitoring devices and document impacts to the area. Staff would submit a written summary to management no later than the close of each calendar year. Issuance of an annual or biennial SUP would give the NPS a consistent opportunity to

evaluate and adjust to resource conditions and promote best management practices in coordination with the property owner.

As a general best practice, the pilots servicing the private parcel would be encouraged to operate consistent with Denali Aircraft Overflights Advisory Council for the Ruth Gorge (“Area 5”) recommendations which include alternative routing through the area to minimize overflight impacts.

Scenic Resources & Visitor Experience

Direct and Indirect Impacts and Mitigation Measures

The presence of the storage areas, totes, and cargo would be visible signs of human presence on the landscape. Impacts from similar storage have included debris being left or lost on the glacier, with the potential to pose a safety hazard to visitors traveling on the glacier and to arriving flights when materials are in unexpected places, are covered by snow, or must be exhumed creating the potential for a hole left on the glacier. The storage of fuels and other liquid materials carries the potential for spills on the glacier in a heavily used area.

A staircase ascending the nunatak is a visible sign of human construction on the landscape. The new location of the stairs, as with the current location, might be an attraction to other park visitors. Changes to the overall footprint of the Mountain House operation carries the potential to alter the experience and sights of the area as experienced by visitors.

The impacts of helicopter operations on the visitor experience are largely addressed above with respect to the acoustic impact. In addition to the audible element, visitors would visually witness the flights and sling load operations. Aviation safety is inextricably tied to the safety of other area visitors. The proposed sling load operations, with known inherent hazards, add complexity to the airspace and landing areas on the Ruth Glacier with the potential for increased risks.

In summary, the activities requested under Alternative 2 would impact scenic resources and the visitor experience as visitors would witness general development and activity from sling load operations, the storage areas, and the stairs.

Mitigation activities related to the construction of the staircase are discussed here and are included under the draft list of conditions for the RWCA, located in the subsequent pages of this EA. The mitigation measures described here would help inform the specific stipulations found in the RWCA.

The applicant intends to relocate the existing staircase to the newly proposed aspect of the nunatak, where it will be extended to meet the glacial ice (Appendix E, Other Images) as it does not safely meet the functional needs of the operation in its current location. The NPS recognizes that the changing conditions on the glacier may warrant future changes to the staircase as well. The RWCA’s language would allow for small changes in the aspect and length of the staircase if conditions demand, when those changes do not result in a net change in impact to park resources. Large changes that could alter the impact would require additional environmental analysis. All changes to the infrastructure on NPS land must be presented to the superintendent before taking action. Once constructed, the NPS would inspect the staircase to ensure compliance with the terms of the RWCA.

To minimize visibility of the staircase, the stair extension would be constructed using wood with minimal to no metal attachment fixtures visible, reflecting the design of the existing stairs. Anchors would be subterranean and no reflectors or guy lines would be installed on NPS land. The specific design for the modification and extension of the stairs and handrails would be approved by the NPS in advance of installation, including a site visit with the landowner. The landowner would be required to provide annual maintenance and ensure the safety and functionality of the stairs located on the NPS land. The property owner indicates that a sign would be placed at the property boundary, specifying that access is for personnel and guests of the lodge and that the stairs are for access to private property only. The RWCA would include a removal clause requiring that any property on NPS land be removed and rehabilitated if unsafe, no longer operational, or no longer needed by Mountain House LLC.

Additional monitoring of activities with the potential to impact Scenic Resources & Visitor Experience would be undertaken during any staff site visit, including visiting the storage areas. Glaciers are in constant motion, proceeding downhill like a slow river. The speed of the Ruth Glacier varies by location on the glacier. The speed of the glacier near the nunatak is approximately one inch per day (3 cm). Vigilant management by the applicant is a necessary component of responsible storage on the glacier due to this movement for protecting park resources and ensuring the safety of all visitors in the area. The NPS has the responsibility to revisit or revoke the requested storage if management of the sites fails to meet the conditions of the permit.

In addition to the mitigation measures discussed here and listed in the draft conditions within this document, the language common to all RWCA's and SUPs provides various tools for protection of park resources and visitor experience generally. Issuance of an annual or biennial SUP would give the NPS a consistent opportunity to evaluate and adjust to resource conditions and promote best management practices in coordination with the property owner. These provisions cover a range of topics and best management practices. Templates of both documents are available in the appendixes.

Eligible Wilderness

Direct and Indirect Impacts and Mitigation Measures

The existence of storage areas and a staircase and the use of helicopters in this alternative would adversely impact the undeveloped quality of wilderness character. In wilderness management documents, Denali has identified “structures and developments for access to inholdings,” “development of inholdings,” and “use of motor vehicles” as indicators to monitor in the undeveloped quality of wilderness character (Burrows et al., 2016). Due to the expansion of the footprint of the private parcel, the use of helicopters and the construction of structures to access the parcel, each of these indicators would show degradation under this alternative.

Additionally, wilderness is to provide outstanding opportunities for solitude, meaning remoteness from sights and sounds of people inside the wilderness (e.g., helicopter noise); remoteness from occupied and modified areas outside the wilderness (e.g., private development) and remoteness from facilities that decrease self-reliant recreation (e.g., staircases). In wilderness management documents, Denali has identified “commercial developments,” “line-of-sight impacts of modern human features both inside and outside the wilderness,” “soundscape impacts” and “signs” as indicators to monitor in the solitude quality of wilderness character (Burrows et al., 2016). Each of these indicators has the potential to be further impacted under this alternative.

Storage areas and helicopter use of NPS land have potential to impact wilderness character and the visitor experience of wilderness. The use of an SUP requires NPS managers to evaluate resource conditions, impacts, and best management practices before re-authorizing these activities (annual or biennial application for renewal).

In summary, Alternative 2 would have direct and indirect impacts on multiple elements of wilderness character in an eligible wilderness area where substantial aviation activity and visitor use is already occurring. Alternative 2 could impact wilderness eligibility through incremental changes to the area, including degradation of solitude, remoteness, and opportunities for self-reliant recreation.

Mitigation for these impacts could include measures listed above for reducing visibility of the staircase; monitoring impacts to the soundscape, ensuring visibility of storage units is low enough to lessen viewshed impacts while maintaining aviation safety, and educating visitors regarding expected opportunities for solitude prior to their trip.

DRAFT Conditions for RWCA

Proposed conditions of the RWCA would include those listed as follows as well as the standard stipulations found in Appendix D. Please note that this list may not be exhaustive as additional conditions may emerge from this analysis.

- Removal of any infrastructure on NPS land required at the expense of the RWCA holder if no longer in use or needed for access.
- Steps to be constructed using wood; anchors to be subterranean and removable if necessary at future time; neither guy lines nor lights permitted; handrail required.
- The property owner is responsible for the maintenance and functionality of the stairs. The NPS has the responsibility to monitor any infrastructure built on NPS land.
- The property owner is permitted to alter the stairs and adjust the associated infrastructure and location if required to maintain functionality. Depending on the scale of the changes proposed, modifications may be acceptable under the initial RWCA. However, no adjustments may occur on NPS land without prior approval from the park superintendent.
- The property owner is responsible for placing signs, at their property boundary so that area visitors are cognizant of the private parcel.
 - These signs should be small but legible at a distance of 10 feet, attached to an existing structure when possible, should not be construed to be advertising, and should contain minimal information so as to not be an additional attractant. No more than two signs may be placed on NPS land.

DRAFT Conditions for SUP (for storage areas and sling load transport of cargo)

Proposed conditions of the SUP would include those listed as follows as well as the standard stipulations found in Appendix E. Please note that this list may not be exhaustive and that the conditions of the permit may change as a result of timing, logistics, changing physical conditions, or efficacy and/or impacts related to the previous permit.

Helicopter Sling load Operations

A Special Use Permit would authorize the use of NPS lands for helicopter sling loads to move cargo from NPS lands to private property. Initially, a new SUP would be authorized annually with the possibility to renew on a biennial basis contingent on resource impacts as determined by monitoring data.

- Passengers are not authorized to be transported via helicopter from NPS lands to private property with this permit.
- Helicopter sling load operations are restricted to occur between 9:00 am and 9:00 pm. This timing will mitigate impacts to visitors in the area and be consistent with rules applied to commercial air taxi operations.
- Helicopter sling load operations will follow guidelines established by the Federal Aviation Administration in Advisory Circular 133-1B for personnel certification and safety procedures for external load operations.
- The permit holder will ensure that their helicopter pilot alerts other aviators in the area during sling load operations on the Denali Common Traffic Advisory Frequency 123.65.
- The permit holder will immediately report any dropped cargo on park lands to the park superintendent. Additionally, the permit holder will submit any required Federal Aviation Administration aviation mishap reports.
- Annually, by September 30, the permit holder will provide the park superintendent with a comprehensive account of all helicopter sling load operations between April 1 and July 31 of the same year. This data will inform the park's natural sound monitoring program for the area of operations and will include:
 - Dates on which sling load operations took place
 - The quantity of daily sling load operations (round trips)
 - The pickup and drop-off location for each sling load operation using NPS land
 - Start and end time of each sling load operation (*e.g. Begin 13:30, end 14:11, total 4 round trips from Landing Zone storage area to helipad, 7/12/19*)

Storage Areas

Up to (2) two storage areas will be authorized on NPS lands for use per year to support cargo storage and helicopter sling load operations. Due to changing glacier conditions, the NPS will regularly evaluate storage area locations, functionality, and impacts and the associated SUP conditions.

- The storage area perimeters must be visible through the use of wands and/or flagging. The permit holder will communicate the current location of storage areas in writing to Denali National Park and Preserve air taxi concession holders.
- Each storage area may contain up to two storage totes ($\leq 48''$ tall). Totes must be secured in a manner that prohibits their movement outside of the storage area.

- All cargo area and storage totes must be excavated within 72 hours following each snow accumulation greater than 12 inches.
- Storage totes are permitted year-round within NPS designated storage areas.
- Cargo that does not fit in storage totes must be bundled immediately and in a manner that it can be retrieved with a sling load operation or snow machine without additional packaging or preparation.
- All cargo must be secured with one of the following methods. No storage of loose items is permitted.
 - An approved storage tote
 - A helicopter net, ready for immediate removal with a sling load operation
 - A helicopter bag (aka “dirt bag”) ready for immediate removal with sling load operation
 - For extra-large items (e.g., lumber), materials must be properly packaged and rigged for immediate transport via sling load operation or snow machine
- From April 1 – August 31, cargo can be stored on NPS designated storage areas for up to 30 consecutive days. However, the permit holder is encouraged to remove cargo as quickly as possible.
- Between September 1 – March 31, cargo can be stored on designated storage areas for up to 14 consecutive days (in recognition of more frequent and greater snowfall).
- Any time cargo stored on NPS land cannot be located, the permit holder must report the lost items to the superintendent within 48 hours of determination. Any unrecoverable items would be subject to investigation in accordance with the System Unit Resource Protection Act (54 U.S.C. §§ 100721 — 100725).
- Fuel storage, not exceeding 24 consecutive hours, is permitted within the storage areas under the following conditions:
 - Diesel, aviation gas, propane, Jet A fuel, motor oil, and glycol must all be in OSHA-approved containers with spill response materials at the storage area.
 - All spills must be reported to the park superintendent within 48 hours of the occurrence. Additionally, notification must be made to the Alaska Department of Environmental Conservation in accordance with their reporting requirements.
 - Equipment fueling operations are prohibited on NPS land since alternatives for fueling exist on the permit holder’s private property.
- Please see SUP template in Appendix E for standard NPS conditions.

Alternative 3: Issuance of RWCA Only (Staircase)

Under Alternative 3, a RWCA would be issued for the modification of a wooden staircase. An SUP would not be issued to permit storage nor sling load operations involving NPS land. It should be noted that while the stairs are intended as a lasting structure, they may undergo alterations or removal if changing conditions warrant the proposed design insufficient, unsafe, or unnecessary.

Acoustic Resources

Direct and Indirect Impacts, and Mitigation Measures

Short of temporary sounds while under construction, the staircase is not anticipated to have notable impacts on the acoustic resources in the area and would not have direct adverse or beneficial impacts on acoustic resources.

Scenic Resources & Visitor Experience

Direct and Indirect Impacts and Mitigation Measures

A staircase ascending the nunatak would add a visible sign of human construction on the landscape and would expand the overall footprint of the Mountain House operation on NPS land. This change carries the potential to alter the experience and sights of the area as experienced by visitors.

As discussed in greater detail under Alternative 2, the stairs would be constructed using wood and a minimalist design in terms of appearance (e.g., use of subterranean anchors only, no use of guy lines or lights), but built to withstand snow loads and alpine weather. The landowner would be responsible for the safety and annual maintenance of the stairs and would mark the boundary of NPS land and the private parcel with a sign indicating the entrance onto private property. If defunct or no longer needed, the staircase would be removed. The landowner intends to relocate and expand upon the existing stairs (Appendix E, Other images).

The NPS would work with the property owner if physical conditions on the rock or ice change in the future. The RWCA's language would allow for small changes in the staircase if conditions demand, when those changes do not result in a net change in impact to park resources. Large changes that would alter the impact would require additional environmental analysis. All changes to the infrastructure on NPS land would be approved by the superintendent before taking action. Please reference the draft RWCA Conditions in the preceding pages.

In summary, altering the setting with the construction of a staircase would have direct adverse impacts on Scenic Resources & Visitor Experience by extending the wooden staircase on NPS land. The new infrastructure would be viewable by area visitors and would introduce a small change to the area's renowned scenic resources. Per communication with the property owner, the new location for the wooden staircase would have the indirect impact of removing an existing staircase from its current location on the nunatak. The current staircase footprint does not enter NPS land but is viewable by area visitors.

Eligible Wilderness

Direct impacts, Indirect Impacts, and Mitigation Measures

As discussed under Alternative 2, construction and existence of a staircase in this alternative would adversely impact the undeveloped quality of wilderness character and would similarly impact the solitude quality of wilderness by expanding visibility of commercial development. In wilderness management documents, Denali has identified “structures and developments for access to inholdings” and “development of inholdings” as indicators to monitor in the undeveloped quality of wilderness character (Burrows et al., 2016). Due to the expansion of the footprint of the private parcel, these indicators would be adversely impacted under this alternative due to the introduction of a staircase on NPS land.

In summary, Alternative 3 would have direct and could have indirect adverse impacts on wilderness character, including the undeveloped quality. Opportunities for solitude, remoteness, and self-reliant recreation would be diminished, but less than under Alternative 2.

Mitigation for the impacts of the stairs could include measures for reducing visibility of the staircase and educating visitors to the area prior to their arrival about the area’s developed setting.

Cumulative Impacts

The cumulative impacts discussion considers the contribution of the proposed action to the past, present and reasonably foreseeable future actions in the project area. Attention is given to the actions proposed under Alternative 2, with reference to the relative impacts between each of the alternatives. Table 2 contains a summary of cumulative impacts that are discussed below.

Past and present actions that have affected the project area include the construction of the original Mountain House and appurtenances including the existing staircase, recent construction of the Sheldon Chalet and associated amenities, the increased popularity of the Ruth Glacier for multiple types of recreation, and the change to NPS ownership of the land after ANILCA. Other actions that have affected the area include identification of the area in the BCMP as a “major landing area,” increased aviation activity in the area over time including concessions contracting by the NPS, data monitoring devices (e.g., acoustic monitoring, weather stations) located in the area, as well as changes in the glacier over time with current trends of glacial retreat from granite walls (e.g., gaps between ice and rock that have increased in recent years).

Reasonably foreseeable future actions are continued popularity of the area that mirror the status quo and continuing uses such as commercial aviation activities, visits by commercial filmers and photographers, research and guided recreation. Additionally, the operators of the chalet may wish to continue to expand flights for lodge guests such as day trips to other parts of the Alaska Range or nearby attractions. The glacier is losing volume, with observable changes as the ice pulls away from rock walls and the crevasses increase in size. Glacial retreat, if it continues, has the potential to change travel on the Ruth Glacier if long-used airstrips or approaches become unusable.

The NPS has identified Alternative 2 as the preferred alternative. While the sling load and storage requests are not approved for inclusion in the RWCA, the NPS finds that Alternative 2 and its use of an SUP for these two activities is logical in context of the complexities of the private parcel. Based on communication with the property owner, the NPS believes that permission to conduct limited sling load operations and to delineate storage areas would have a more protective outcome for the area’s resources as compared to the other alternatives under which additional helicopter flights with long approaches from outside of the park are indicated by the property owner and are therefore considered reasonably

foreseeable future actions. Authorization via SUP acknowledges that storage on the glacier and limited sling load operations may be less impactful than other alternatives as well as allowing adjustments (e.g. to conditions such as timing and quantity) to protect park resources.

Acoustic Resources

NPS acoustic measurements by their very nature represent a record of the cumulative noise impact to an area over the sampling period. Therefore the measurements from 2002 and 2016 cited in Appendix B give a concrete basis to estimate how activities of the preferred alternative would sum with existing noise impacts to form a cumulative whole. However, these measurements do not capture changes in noise due to increased helicopter use to access the Sheldon Chalet which occurred in 2017 and 2018.

Under the preferred alternative (and relative to the No Action Alternative given 2016 conditions), the addition of four minute long helicopter sling load flights three days each week would result in a further deviation from compliance with two Denali BCMP standards. These effects are comparatively small and reflect that the requested change is a small relative change given the existing high levels of aviation activity. Under this alternative, +0.8% of all summer hours would exceed the sound pressure level standard, and +0.8% of all summer events would exceed the audibility standard, for a total impact of 18.1% and 41.7%, respectively.

Relative to busy summer months, sling loading flights would stand out more during winter months and would constitute a greater proportion of the cumulative effects on the acoustic environment, which is expected to be generally free of human sounds. No measurements have been taken in the amphitheater during winter months, but the existing percentage of time noise is audible is presumed to be low.

Cumulative impacts under Alternatives 1 and 3 could range from little or no change to the status quo to notable changes for acoustic resources both in the immediate vicinity and across a broader geographic area. Based on communication with the property owner, more helicopter flights directly to the private parcel from Talkeetna (Figure 1) or other locations outside of the park are anticipated to occur in the absence of localized sling loading (Alternatives 1 and 3) in order to bring in supplies and support hotel operations. Therefore cumulative impacts to acoustic resources over a larger area, potentially including the Ruth Gorge as well as miles of terrain between the parcel and helicopter landing areas outside of the park, could occur if additional flights directly to the private parcel increase in frequency.

In summary, the contribution of the proposed sling load operations to the cumulative acoustic situation in the project area is small. Relative to the range of possible acoustic impacts under Alternatives 1 and 3, Alternative 2 may be less impactful to cumulative acoustic resources in the project area as well as across a broad geographic area.

Scenic Resources & Visitor Experience

Issuance of a RWCA and SUP as described under Alternative 2 would introduce additional activity and small amounts of infrastructure in an expansive landscape, predominantly devoid of visible human presence. Relative to the scale of the Alaska Range and the Ruth Glacier, a helicopter in use, stored materials and a staircase are diminutive in size. However, for many visitors to the Ruth Glacier who arrive at and recreate near the airstrip and in the amphitheater, these additions would be in the foreground and would constitute incremental additional human influence in addition to the Sheldon Chalet and Mountain House, the support materials and infrastructure for the lodge operation, the arrival and

departure of numerous flights daily during the busy season, and the general presence of recreationists on the glacier.

The visitor experience on the Ruth Glacier has changed over time, generally trending toward increased aviation and visitation. For some visitors this may be positive while for others, it is a negative trend. Regardless, approval of the applicant's proposed activity would continue that trend with a relatively small contribution of new activity to the cumulative activity already occurring. With increased activity and traffic to, from, and in the vicinity of the chalet, other visitors and air tour operators may direct visits elsewhere, bringing the potential to impact park resources in other locations in the Alaska Range within Denali.

Cumulative impacts under Alternative 1 might be unchanged from the status quo or could change concurrent with the reasonably foreseeable future action of additional helicopter flights directly to the private parcel as indicated by the property owner. Alternative 3 carries a similar potential cumulative impact to the preferred alternative, and shares the reasonably foreseeable future action of additional helicopter flights directly to the private parcel as under Alternative 1.

Eligible Wilderness

Under the preferred alternative, the expansion of the development footprint both on the private parcel and on NPS land used in support of the private enterprise, combined with incremental alterations of the soundscape over time, could impact wilderness character at this time as well as the future eligibility of the area for wilderness designation. As previously referenced, the NPS has identified Alternative 2 as the preferred alternative in the EA within the broader context and many considerations salient to this project, including the reasonably foreseeable future action of elevated numbers of flights directly to the parcel indicated under Alternatives 1 and 3.

Under Alternative 1, no substantial impacts to wilderness character would occur as a direct result of NPS permitting, but a range of impacts is possible when considered relative to the complexities of the setting and landowner's plans. Under Alternative 3, the extension of a staircase onto NPS land would affect the undeveloped quality of wilderness character, but is required for adequate and feasible access. Considering the largely primeval nature of the surrounding landscape, the contribution to cumulative effects on wilderness character by this staircase would be small. In addition, impacts to wilderness character from the proposed action could be reversed in the future if these actions ceased and structures were removed.

Table 2. Summary of Cumulative Impacts

Issue	Alternative 1: Existing Conditions (No Action)	Alternative 2: Issuance of RWCA & Special Use Permit	Alternative 3: Issuance of RWCA Only (Staircase)
Acoustic Resources	<ul style="list-style-type: none"> ● Existing condition (“summer”): Area experiences numerous acoustic events and is out of compliance with standards in the BCMP ● Existing condition (“winter”): Area is mostly devoid of acoustic events and is in compliance with BCMP ● Ranges from very little change in status quo to reasonably foreseeable future action of increased numbers of helicopter trips directly to the parcel for transport of cargo relative to Alternative 2 	<ul style="list-style-type: none"> ● Summer months: the current cumulative case is such that standards for acoustic levels are often exceeded. Up to 30 additional sling load flights would be relatively small, such that an additional +0.8% exceedance could occur ● Winter: against the more quiet acoustic environment found during the lower months for visitation, the proposed additional flights would be more pronounced and each acoustic activity would be more distinct, although would remain in standard with the BCMP 	<ul style="list-style-type: none"> ● Ranges from very little change in status quo to reasonably foreseeable future action of increased numbers of helicopter trips directly to the parcel for transport of cargo relative to Alternative 2

Issue	Alternative 1: Existing Conditions (No Action)	Alternative 2: Issuance of RWCA & Special Use Permit	Alternative 3: Issuance of RWCA Only (Staircase)
Scenic Resources & Visitor Experience	<ul style="list-style-type: none"> ● Existing condition: Area largely devoid of human construction, renowned glaciated alpine setting, airplanes & visitors located near airstrips during summer months, presence of Sheldon Chalet and Mountain House and associated infrastructure (outbuildings, stairs, communication devices) on private property ● Very little change to status quo possible ● Level of impact to cumulative setting expected to be small relative to scale of the natural landscape, and level of impact to visitors' soundscape experience would correlate with changes in activity directly to parcel ● Ranges from very little change in status quo to reasonably foreseeable future action of increased numbers of helicopter trips directly to the parcel for transport of cargo relative to Alternative 2 	<ul style="list-style-type: none"> ● Relative to the scale of the Alaska Range and the Ruth Glacier, a helicopter in use, stored materials and a staircase are diminutive in size relative to the area's overall visual expansiveness ● The additional activity and presence of physical objects and small increase in audible noise constitutes a relatively small new contribution of new activity to the existing cumulative setting for visitors 	<ul style="list-style-type: none"> ● Relative to the scale of the Alaska Range and the Ruth Glacier, a modified staircase location, including the extension on NPS land, constitutes a small change to the cumulative case for Scenic Resources & Visitor Experience ● Aside from the staircase, possible impacts range from very little change in status quo to reasonably foreseeable future action of increased numbers of helicopter trips directly to the parcel for transport of cargo relative to Alternative 2

Issue	Alternative 1: Existing Conditions (No Action)	Alternative 2: Issuance of RWCA & Special Use Permit	Alternative 3: Issuance of RWCA Only (Staircase)
Eligible Wilderness	<ul style="list-style-type: none"> ● Existing condition: Area largely devoid of human construction such that wilderness character is largely intact; however, presence of infrastructure on private parcel, airplanes, acoustic events, and the presence of large numbers of visitors at times make the project area more hectic than many areas managed as eligible wilderness ● Ranges from very little change in status quo to reasonably foreseeable future action of increased numbers of helicopter trips directly to the parcel for transport of cargo relative to Alternative 2 	<ul style="list-style-type: none"> ● The expansion of the development footprint and potential for increase in aviation and accordant acoustic impacts on NPS land carries the potential for incremental additional adverse impacts to undeveloped and solitude qualities of wilderness and thus to the cumulative impacts on wilderness character and eligibility 	<ul style="list-style-type: none"> ● The addition of a short staircase on NPS land would have an adverse effect on the undeveloped quality of wilderness character, a small change to cumulative impacts to wilderness character ● Aside from the staircase, possible impacts range from very little change in status quo to reasonably foreseeable future action of increased numbers of helicopter trips directly to the parcel for transport of cargo relative to Alternative 2

8 Consultation and Coordination

Robert and Marne Sheldon, parcel owners and owners of the Sheldon Chalet and Mountain House LLC (“Applicant”)

Tribal Consultation conducted with seven Alaska Tribes and two Alaska Tribal Corporations

Relevant subject matter experts in NPS Alaska Regional Office & Denali National Park and Preserve (glaciology, acoustic science, social science, law and policy with respect to regulation and ANILCA, commercial services, wilderness, etc.)

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Federal Law and Regulation

1980. Alaska National Interest Lands Conservation Act (ANILCA, 16 USC §§ 3101-3233, Pub. L 96-487)

United States Code of Federal Regulations Title 36 § 2.12 - Audio Disturbances

United States Code of Federal Regulations Title 36 § 1-7, 13.45

United States Code of Federal Regulations Title 43 § 36.10

US Department of the Interior (DOI), National Park Service (NPS)

1986. *Denali National Park and Preserve General Management Plan*, NPS Denver Service Center, NPS D-96-A

2000. National Park Service (NPS), Director's Order #47. *Soundscape Preservation and Noise Management*. U.S. Department of the Interior, National Park Service, Washington, D.C.

2006. *Denali National Park and Preserve Backcountry Management Plan and General Management Plan Amendment*

2006. National Park Service *Management Policies*

2007. National Park Service *An Interim User's Guide to Inholdings in National Park System Units in Alaska* (<https://www.nps.gov/locations/alaska/upload/AccessGuide-1.pdf>)

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2010 National Park Service (NPS) Director's Orders #53 & Reference Manual #53. *Special Park Uses*. U.S. Department of the Interior, National Park Service, Washington, D.C.

Access and Use Request, Ruth Glacier, Mountain House LLC
PEPC #82537

APPENDIX A
SUBSISTENCE - SECTION 810(a) OF ANILCA
SUMMARY EVALUATION AND FINDINGS

Access and Use Request, Ruth Glacier, Mountain House LLC

I. INTRODUCTION

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluation of potential restrictions to subsistence activities that could result from issuing a Right of Way Certificate of Access (RWCA) and a special use permit (SUP) for a 4.99 acre private parcel located on a nunatak (an isolated piece of rock protruding above a glaciated area) on the Ruth Glacier within the Alaska Range of Denali National Park and Preserve.

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 will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

ANILCA created new units and additions to existing units of the National Park System in Alaska. Denali National Park and Preserve was created by ANILCA Section 202(3)(a):

"The park additions and preserve shall be managed for the following purposes, among others: To protect and interpret the entire mountain massif, and additional scenic mountain peaks and formations; and to protect habitat for, and populations of, fish and wildlife, including, but not limited to, brown/grizzly bears, moose, caribou, Dall sheep, wolves, swans and other waterfowl; and to provide continued opportunities, including reasonable access, for mountain climbing, mountaineering, and other wilderness recreational activities."

ANILCA Section 202(3) also states: "Subsistence uses by local residents shall be permitted in the additions to the park where such uses are traditional in accordance with the provisions in Title VIII.

Title I of ANILCA established national parks for the following purposes:

"... 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 to the citizens of Alaska and the Nation, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered arctic tundra, boreal forest, and coastal rainforest ecosystems to protect the resources related to subsistence needs; to protect and preserve historic and archeological sites, rivers, and lands, and to preserve wilderness resource values and related recreational opportunities including but not limited to hiking, canoeing, fishing, and sport hunting, within large arctic and subarctic wildlands and on free-flowing rivers; and to maintain opportunities for scientific research and undisturbed ecosystems.

"... consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for which each conservation system unit is established, designated, or expanded by or pursuant to this Act, to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so."

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

Alternative 1 - Existing Conditions (No Action)

Under Alternative 1, no RWCA nor SUP would be issued for the proposed uses of NPS land based on the conclusion that reasonable access to the parcels currently exists. The property owner would still be able to access the private parcel via those means permitted generally on NPS or via ANILCA 1110(a) (fixed wing flights, snow machines, foot traffic) as well as directly to the parcel via helicopter from Talkeetna. Construction of stairs, other support facilities, and storage areas could still occur on private land and would be at the discretion of the property owner.

Under this alternative, no steps would be constructed by the property owner and no storage would be permitted on NPS lands. Helicopter activity requiring NPS land would not be permitted. Permission for, types of, and frequency of access not approved under ANILCA might remain inconsistent, as in the past.

Alternative 2 – Issuance of RWCA and Special Use Permit (NPS Preferred)

The NPS is considering issuing permit(s) for the following requested uses of NPS lands:

- Two (2) storage areas (15 feet x 15 feet flagged area), at flat locations on NPS land, between private parcel and glacial landing strips, where a white storage tote would be stored (One (1) on each site, measuring 36"x48"x30" or similar – see Appendix F, Other Images) & temporary storage of other materials related to lodging operations

- Construction of stairs along a ridgeline approximately 35 feet lateral distance x 3 feet wide on NPS land (metal stakes, into rock, removable— see Appendix F, Other Images)
- Three (3) days of helicopter sling load operation/week; approximately three (3) to ten (10) trips per day, to transport cargo using slinging operation for movement of materials. Sling load only, no helicopter landing on NPS land permitted.

Under Alternative 2, a RWCA and an SUP would be issued for the activities requested by the applicant as detailed above. The RWCA would permit construction of and maintenance of a wooden staircase descending from the private parcel to the glacier, entering NPS land for approximately 35 lateral feet beyond the south end of the private parcel. The stairs would be three feet wide and would be affixed via removable metal stakes into rock and soils. The stairs on the NPS land would be maintained such that they function safely for pedestrian passage and would be removed if no longer needed or maintained. The applicant could limit access to the stairs at the private property boundary. The NPS recognizes that the nature of the glacier is changing and changes to the staircase might be necessary in the future. Small changes could be approved under the initial RWCA upon notice of and approval by the superintendent. Limits to the possible changes that could be undertaken without superintendent's approval would be included in the conditions of the RWCA. Substantial changes would require an amendment to the RWCA and could warrant additional NEPA analysis.

An SUP would permit the applicant to establish two total storage areas on the Ruth Glacier. These 15 feet x 15 feet staged areas would be identifiable to other areas users by the use of wands or flagging and would be communicated via written communication detailing coordinates and other identifiers. The location of the storage areas might change during the season in response to changes to the glacier and could be moved accordingly, while remaining proximal to the landing areas. Relocation of the storage areas greater than 100 feet from the approved location would require permission from the superintendent. The storage areas would each house one white storage tote and would serve as staging of cargo (items in support of hotel operations) transported to/from the glacier via fixed wing aircraft. The applicant's intent is to move any cargo as quickly as possible to the private parcel, weather and logistics permitting. Staged materials could include diesel, aviation gas, propane, Jet A fuel, motor oil, and glycol in OSHA approved containers with provisions for spill response kept on site. With the exception of the storage totes, no particular item may be stored on the glacier for more than four months (36 CFR 13.45).

An SUP would permit the applicant to transport cargo from the airstrip or the flagged storage sites to the private parcel using a sling load operation, whereby materials are transported using a heavy cable that descends from a helicopter that uses a hook to attach and transport materials. Helicopter sling load operations could occur up to three days each week, up to ten round trips on each of those days between the private parcel and the location of the staged cargo. The NPS would set limits on the timing of these trips in the SUP.

Alternative 3 – Issuance of RWCA only (staircase)

Under Alternative 3, a RWCA would be issued for the construction of the wooden staircase and no SUP would be issued for the establishment of cargo sites nor helicopter sling load.

The RWCA would permit construction of and maintenance of a three foot wide wooden staircase, bolted to soils and rocks on approximately 35 lateral feet of NPS land. Extensive changes to the staircase would require permission from the superintendent, as described under Alternative 2.

Under this alternative, the applicant could still store materials for up to 24 hours, per federal regulation common to NPS lands generally. Further analysis and potential changes related to the administration of other aviation use in the area would be required before the NPS could authorize an SUP for the requested cargo transport via sling load and helicopter.

IV. AFFECTED ENVIRONMENT

Subsistence uses within Denali National Park and Preserve are permitted in accordance with Titles II and VIII of ANILCA. Section 202(3)(a) of ANILCA allows local residents to engage in subsistence uses, where such uses are traditional in accordance with the provisions in Title VIII. Lands within former Mount McKinley National Park are closed to subsistence uses.

A regional population of approximately 300 eligible local rural residents qualifies for subsistence use of park resources. Resident zone communities for Denali National Park are Cantwell, Minchumina, Nikolai, and Telida. By virtue of their residence, local rural residents of these communities are eligible to pursue subsistence activities in the new park additions. Local rural residents who do not live in the designated resident zone communities, but who have customarily and traditionally engaged in subsistence activities within the park additions, may continue to do so pursuant to a subsistence permit issued by the park superintendent.

The NPS realizes that Denali National Park and Preserve may be especially important to certain communities and households in the area for subsistence purposes. The resident zone communities of Minchumina and Telida use park and preserve lands for trapping and occasional moose hunting along area rivers. Nikolai is a growing community and has used park resources in the past. Cantwell is the largest resident zone community for Denali National Park and Preserve, and local residents hunt moose and caribou, trap, and harvest firewood and other subsistence resources in the new park area.

Primary subsistence species, by edible weight, are moose, caribou, furbearers, and fish. Varieties of subsistence fish include Coho, King, Pink and Sockeye salmon. Dolly Varden, Grayling, Lake Trout, Northern Pike, Rainbow Trout and Whitefish are also among the variety of fish used by local people. Beaver, coyote, land otter, weasel, lynx, marten, mink, muskrat, red fox, wolf and wolverine are important furbearer resources. Shed (discarded) animal parts and plants are collected and used for subsistence purposes. Rock and willow ptarmigan, grouse, ducks and geese are important subsistence wildlife resources. Wild berries are also commonly harvested for subsistence use near the project site.

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 any given year many vary considerably from previous years because of such factors as weather, migration patterns and natural population cycles. However, the pattern is assumed to be generally applicable to harvests in recent years with variations of reasonable magnitude.

V. SUBSISTENCE USES AND NEEDS EVALUATION

To determine the potential impact on existing subsistence activities, three evaluation criteria were analyzed relative to existing subsistence resources that could be impacted.

The evaluation criteria are:

- the potential to reduce important subsistence fish and wildlife populations by (a) reductions in numbers; (b) redistribution of subsistence resources; or (c) habitat losses;
- the effect the action might have on subsistence fishing or hunting access; and
- the potential to increase fishing or hunting competition for subsistence resources.

The Potential to Reduce Populations:

Provisions of ANILCA and Federal and State regulations provide protection for fish and wildlife populations within Denali National Park and Preserve.

All of the proposed actions and permits being considered by the NPS (construction of a staircase, permission to establish two non-permanent storage areas, and up to 30 short sling load round trip flights per week) would occur in a glaciated area where fish are not present and the presence of wildlife is limited to low numbers of small mammals and avian species. These activities would take place at a remote alpine location with limited habitat for most wildlife. The implementation of the proposed alternatives is not expected to adversely affect or significantly restrict the distribution or migration patterns of subsistence resources. No change in the availability of subsistence resources is anticipated.

Restriction of Access:

Section 811 of ANILCA addresses “Access” for subsistence as follows: “The Secretary shall ensure that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on public lands.” The proposed alternatives are not expected to significantly restrict traditional subsistence use patterns on federal public lands within the region.

Increase in Competition:

The proposed alternatives are not expected to significantly increase competition for subsistence resources on federal public lands within the region. Provisions of ANILCA and NPS regulations mandate that when it is necessary to restrict the taking of fish or wildlife, subsistence users will have priority over other users groups.

VI. AVAILABILITY OF OTHER LANDS

The proposed action is consistent with the mandates of ANILCA, including Title VIII, and the NPS Organic Act.

VII. ALTERNATIVES CONSIDERED

Alternative options for access and storage as requested by the landowner (applicant) were discussed and are detailed in the EA. All alternatives discussed occur generally within the same geographic area with no appreciable difference with respect to impacts on subsistence resources.

VIII. FINDINGS

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

2012 Denali Air Tour Operators Best Practices to Minimize Sound Impacts. Available at https://www.nps.gov/dena/getinvolved/aoac.htm#CP_JUMP_5151844 (See Area 5 = Ruth)

2013 National Park Service (NPS), 2013. *Acoustical Monitoring Training Manual - Second Edition*. National Park Service, Fort Collins, Colorado

2013 National Park Service (NPS) Director's Order #41. Wilderness Stewardship. U.S. Department of the Interior, National Park Service, Washington, D.C.

2015. *NPS NEPA Handbook*; Director's Orders #12; available at: National Park Service NEPA Handbook (<https://sites.google.com/a/nps.gov/nepa-handbook/home>)

2018. Denali National Park and Preserve. *South-Side Scenic Flight Passenger Analysis 2016-2018* (Internal, available upon request)

Appendix B. Acoustic Analysis

Field Measurements



Figure 1. Acoustic recording system deployed to the amphitheater, 2016.

Acoustic field observations have been made at the Ruth Amphitheater site (“Ruth Amphitheater” terminology cited per use in 2006 Denali Backcountry Management Plan) on two separate occasions. A Larson Davis Type 824 sound level meter was deployed from 05/14/02 – 07/19/02 and collected data for portions of that time. These data were originally summarized in the BCMP (NPS 2006 pp. 126 – 127). A Larson Davis Type 831 sound level meter was deployed 04/26/16 – 08/17/16 and collected data for the entire sampling period. Standard NPS methods for collecting and analyzing acoustic data are described in Lynch et al. 2011, NPS 2013.

Importantly, these measurements provide quantitative descriptions of the natural acoustic environment in the affected area. NPS Management Policies 2006 §4.9 states that the NPS, “*will preserve, to the greatest extent possible, the natural soundscapes of parks*” and provides a standard from which impacts are measured – “*the environment of sound that exists in the absence of human-caused noise*” (NPS 2006b.) Director’s Order #47 articulates this concept further by recognizing that natural sounds are, “*inherent components of ‘the scenery and the natural and historic objects and the wild life’ protected by the NPS Organic Act*” (NPS 2000.)

Thus the first step in decision making is to consider the acoustic environment itself. Table 1 includes the natural ambient level – the expected 50th percentile sound pressure level (SPL) in the absence of human-caused noise – as well as the observed 10th percentile SPL for the measurement location in the amphitheater, a commonly used measure representing a natural minimum or ‘floor’. Because the

following noise analyses are not detailed enough to include spectral considerations, no spectral properties of the natural acoustic environment are included here.

Table 1. Measures of the natural acoustic environment in the Ruth Amphitheater.

Measurement Site	Natural Ambient Level	10 th Percentile Sound Pressure Level (L90)
Ruth Amphitheater 2002	26.7 dBA*	25.9 dBA*
Ruth Amphitheater 2016	28.4	27.6

*L_{Aeq, 24 hour} (12.5 – 20000 Hz)

Compliance with Denali Backcountry Management Plan Standards

Measurement sites along Denali’s Ruth Glacier are consistently among the locations most impacted by noise in the park, and indeed, among locations across all parks in Alaska. The summed impact of commercial and government aviation in these areas may be quantified through the use of acoustic metrics, as summarized in Table 2.

Table 2. Noise metrics comparing conditions on the Ruth Glacier to those typical for parks in Alaska. The 2016 Ruth Amphitheater site is the most recent measurement within audible range of the proposed action. The other sites included might all also be affected by the decision.

Measurement Site	Overall Percent Time Noise is Audible	Median Noise Free Interval*	Median Noise Events Per Day
Ruth Amphitheater 2002	20.5% of sample	3.0 minutes	48.0 per day
Ruth Amphitheater 2016	17.5%	3.9	33.0
Backside Lake 2014	14.5%	4.0	49.5
Toe of the Ruth Glacier 2006	12.8%	4.9	54.0
Toe of the Ruth Glacier 2017	21.8%	5.0	45.0
<i>Median Conditions in Alaskan Parks</i>	3.7%	27.8	14.0

*Median noise free interval describes the typical amount of time between when one noise event ends and when the next begins.

Denali’s Backcountry Management Plan implemented three standards for acceptable condition of the acoustic environment in the vicinity of the Ruth Glacier (NPS 2006 pg. 41):

1. **Percent Time Audible:** “motorized noise may be audible up to 50% of any hour”
2. **Events Per Day:** “up to 50 motorized noise intrusions per day”
3. **Maximum Sound Pressure Level:** “motorized noise does not exceed 60 dBA”*

(*note that this level also corresponds to the maximum level for motorized noise allowed as per Federal Regulation, 36 C.F.R. § 2.12, as well as speech interference at 1 meter as per EPA 1974.)

There is some level of exceedance of every BCMP standard in the amphitheater and greater Ruth Glacier area. Table 3 describes the base rate of exceedance for each indicator in the plan. Notably, conditions have improved in the amphitheater over the period from 2002 to 2016.

Table 3. Exceedance of Denali’s BCMP standards at measurement sites along the Ruth Glacier. No site sampled in this area was in compliance with the BCMP.

Measurement Site	Percent Time Audible Standard	Events Per Day Standard	Sound Pressure Level Standard
Ruth Amphitheater 2002	21% of hours	31% of days	57% of events
Ruth Amphitheater 2016	17%	27%	41%
Backside Lake 2014	9%	48%	14%
Toe of the Ruth Glacier 2006	4%	59%	22%
Toe of the Ruth Glacier 2017	19%	23%	20%

To assess how each alternative may influence the noise impact to these landscapes, each indicator is considered in turn.

Percent Time Audible Standard (Hours)

The percent time audible standard is evaluated on an hour-by-hour basis. During the summer of 2016, 17% of the hours had noise audible more than 50% of the time. This puts the amphitheater area out of compliance with the BCMP. Throughout the winter the base rate of exceedance has not been measured, but it is expected to be close to zero.

In their Right-of-Way application, Mountain House LLC requests helicopter transport of up to ten loads of cargo on up to three days per week. From this information it is possible to simulate the expected impact of operations as a function of their duration. Using observations from 2016, three hours out of every week are selected at random and impact duration is added to the current audibility of noise. Repeated many times this provides a way to visualize potential noise impacts, as shown in Figure 2. The graph includes two possible ways of accomplishing cargo transport activities – by ‘*sling-loading*’ (i.e., moving cargo with a net suspended below the helicopter) or by ‘*hot loading*’ (i.e., loading and unloading cargo from the cabin of the helicopter iteratively while the rotors are turning). Previous observations suggest that sling-loading operations would take approximately four minutes to conduct by sling-loading operations, while hot-loading may require upwards of 40 minutes to accomplish safely.

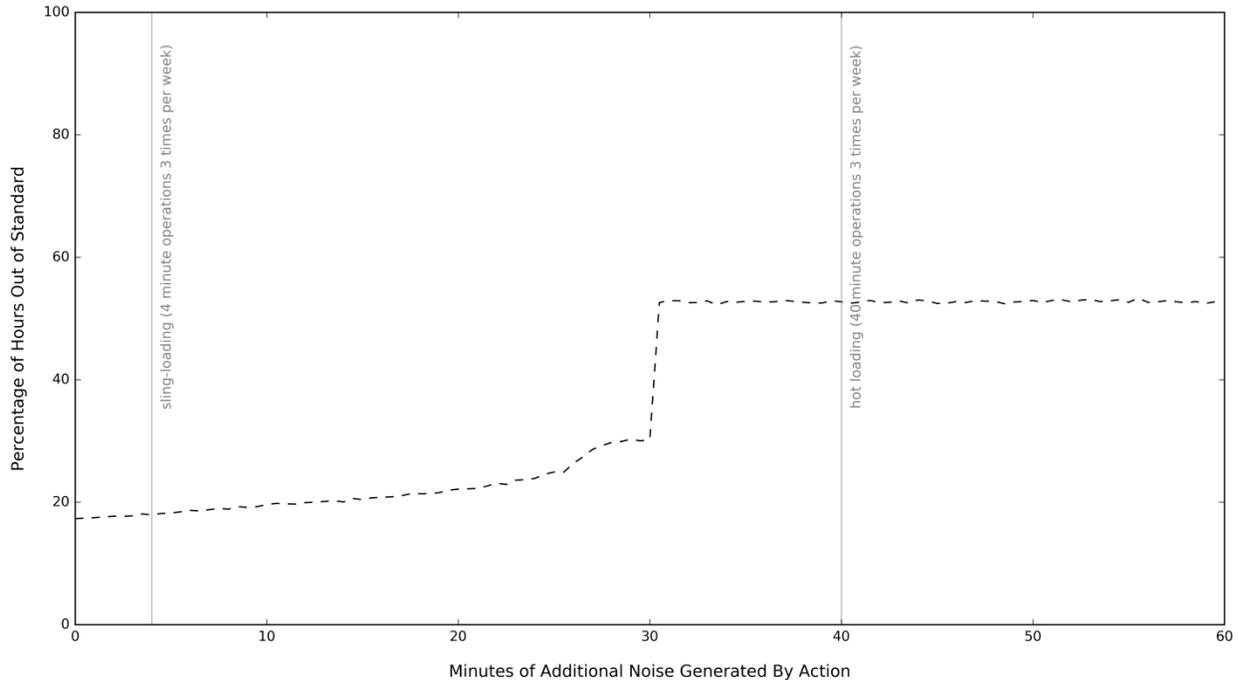


Figure 2. Effect of cargo transport duration on compliance with the Denali BCMP Percent Time Audible standard in the Ruth Amphitheater. In the case of the No Action Alternative, 17% of hours are expected to exceed the standard. Vertical lines indicate the duration of two different approaches to accomplishing the cargo transport activities proposed. Activities exceeding 30 minutes would automatically exceed the standard for all hours which they occur in.

This analysis suggests that *any* cargo transport activity with helicopters would cause the Ruth Amphitheater to further deviate from compliance with the BCMP. However, for activities lasting less than four minutes the increase in noise is minor: +0.8% of sampled hours out of compliance with standard. Activities that last more than 30 minutes would result in an increase of +35.4% of sampled hours out of compliance with standard. This represents an approximate tripling of the current rate of exceedance.

Figure 2 could be used equally well to assess impacts associated with Alternatives 1 (Existing Conditions/No Action) and 3 (Issuance of RWCA only), but requires knowledge of the expected pattern of helicopter and/or snowmachine use for cargo transport directly to the private parcel. Currently the NPS does not have knowledge of the applicant's plans in such a scenario.

Events Per Day Standard

The events per day standard is evaluated on a day-by-day basis. During the summer of 2016, 27% of days had more than 50 noise events per day. This puts the amphitheater area out of compliance with the BCMP. Throughout the winter the base rate of exceedance has not been measured, but it is expected to be close to zero.

A single cargo-transport related noise event is anticipated three days a week. Using a similar approach as implemented for the percent time audible standard above, a graph can be created that shows how increasing the number of noise events would influence exceedance of the standard in the amphitheater. Figure 3 shows that the proposed rate of cargo transport activities is expected to result in no additional days out of standard.

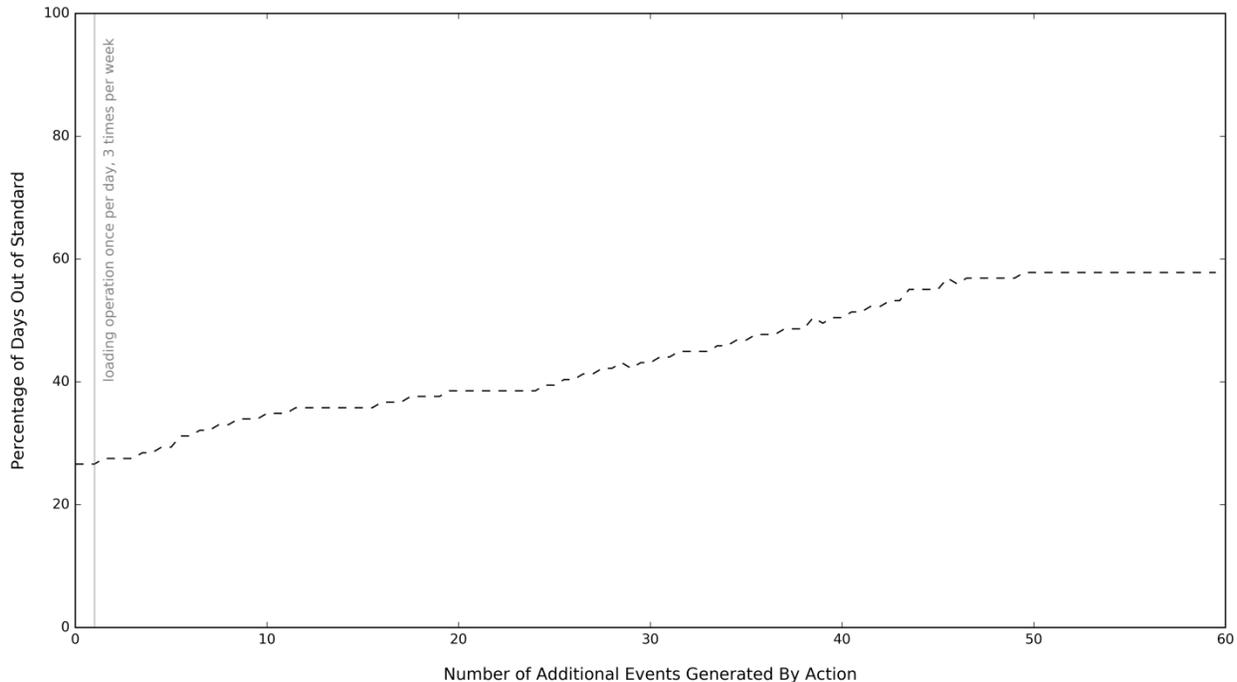


Figure 3. Effect of cargo transport rate on compliance with the Denali BCMP Percent Time Audible standard in the amphitheater. In the case of Alternative 1 (No Action), 27% of days are expected to exceed the standard. Vertical line indicates the single cargo transport noise event expected three times per week. No anticipated change in exceedance of the standard is anticipated from any of the presented Alternatives.

Maximum Sound Pressure Level Standard

The maximum SPL standard is evaluated on an event-by-event basis. During the summer of 2016, 41% of noise events had a maximum SPL greater than 60 dBA. This puts the amphitheater area out of compliance with the BCMP as well as 36 C.F.R. § 2.12. Throughout the winter the base rate of exceedance has not been measured, but it is expected to be small.

Because the maximum SPL of an event is related to the mechanical properties of noise sources and their trajectories through space, it is possible to estimate compliance with BCMP standards based on the specifics of the activity in question. Here we model the spread of helicopter noise over the landscape using acoustical modelling software NMSim (version 1.0.0.5, Blue Ridge Research and Consulting 2014). The model accounts for attenuation effects of terrain, ground cover, weather, and atmospheric state.

Input parameters of the model were designed to be as close as possible to environmental conditions during climbing season in the amphitheater. Source parameters were chosen to estimate as closely as possible vehicle behavior during cargo transport operations. Table 4 is a concise list of relevant parameters, their descriptions, and justification. Basic notes on the limitations of each choice are also included.

Table 4. NMSim software input parameters with a justification for their selection in this specific case. Also included – where relevant – are notes on potential limitations of any assumptions used.

Parameter	Choice	Source of Information	Justification	Limitations / Possible Sources of Error
Source Type	AStar 350	USDOT database	Of the helicopter types with potential to be used for cargo transport the AStar is the more powerful model.	If a less powerful helicopter is used for sling loading, the footprint of the impact may be smaller.
Source Height (ft)	100 feet above ground	Estimate	Observations of low altitude sling-loading operations at other locations with AStar.	Input of source height must be a constant value, thus 100 feet represents an average height over the entire trajectory.
Air Temperature on the Ground (°C)	3.8°	Sound station thermometer, median over 2016 sampling period	Observed conditions at site during the summer months.	In the absence of additional information, we assume that operations could take place any time of day. They probably would take place during daytime hours. Conditions during winter months may differ significantly.
Relative Humidity, Air (%)	92.0%	Sound station relative humidity gauge, median over 2016 sampling period	Observed conditions at site during the summer months.	This parameter affects how quickly sound is attenuated by absorption, an effect which is strongest at high frequencies. Vehicle noise is almost entirely radiated at frequencies less than 1250 Hz. Therefore, error in relative humidity is not expected to contribute much error to an estimate of broadband SPL.

The following graphics visualize the noise of an AStar 350 helicopter during cargo transport – specifically the maximum SPL, as per the Denali BCMP. The three maps clip the noise footprint to different impact criteria: **(1)** the natural ambient level – estimated at 28 dBA (Table 1), **(2)** 40 dBA as per the Denali BCMP standard for the Management Unit *Old Park 1*, and **(3)** 60 dBA as per the Denali BCMP standard for Management Unit *A*.

Figure 4 shows that noise from these operations may be audible within Designated Wilderness (Management Unit *Old Park 1*), influencing compliance with the Events Per Day standard in this area. However, from Figure 5 we can see that SPL is not expected to exceed the BCMP standard in this zone (40 dBA.) Figure 6 shows that there is some park area that is out of compliance with the SPL standard for Management Unit *A* (60 dBA), but that exceedance would be largely constrained to the *‘Ruth Amphitheater Major Landing Area’* described in the BCMP.

Noise Predicted From AS350 Helicopter

Maximum Sound Pressure Level of event down to Natural Ambient Level (28 dBA)

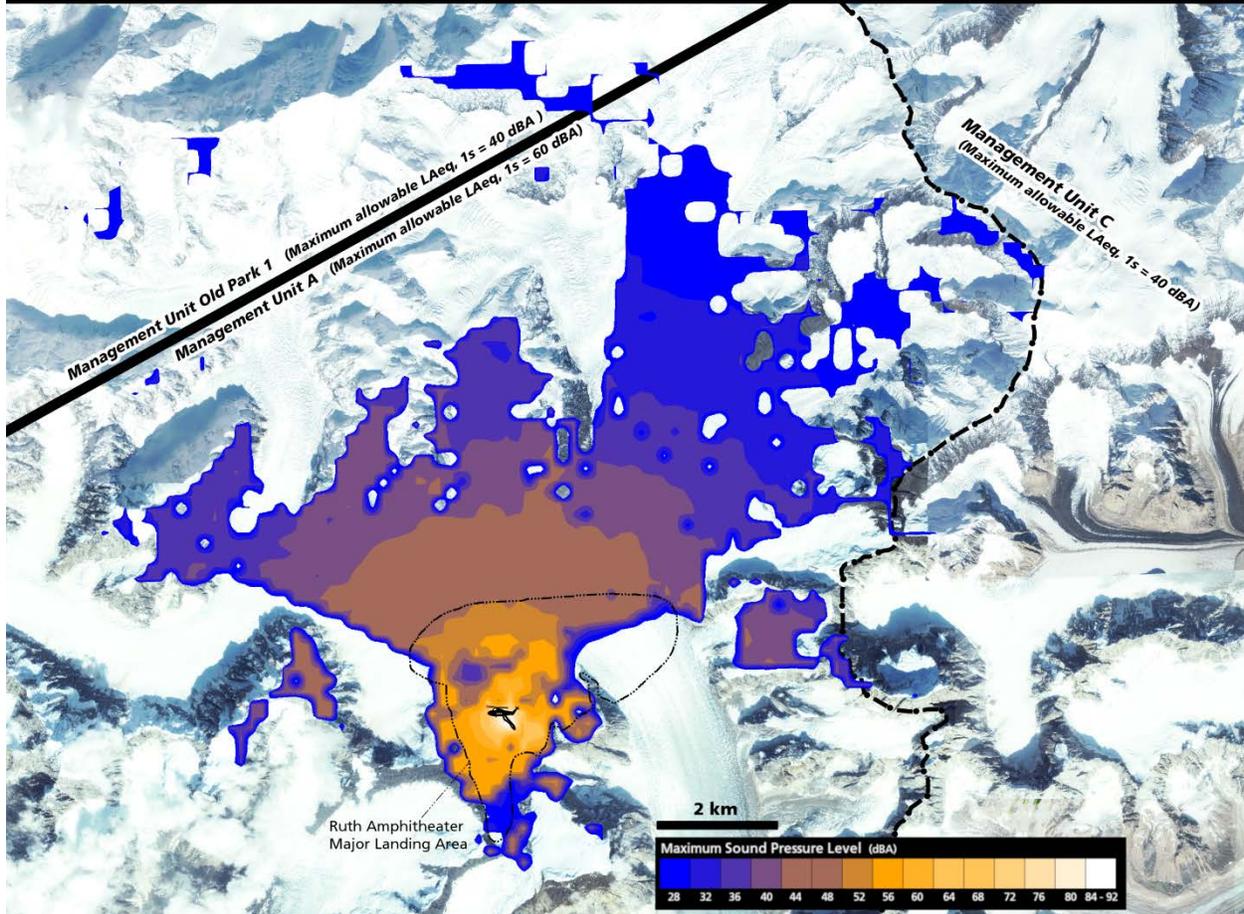


Figure 4. Map of noise predicted to spread into Denali National Park from helicopter cargo transport operations. Noise footprint is clipped to the expected natural ambient level in the area, 28 dBA. The trajectory used in the model is represented as a small line to the southeast of the helicopter icon.

Noise Predicted From AS350 Helicopter Maximum Sound Pressure Level of event down to Old Park 1 Standard (40 dBA)

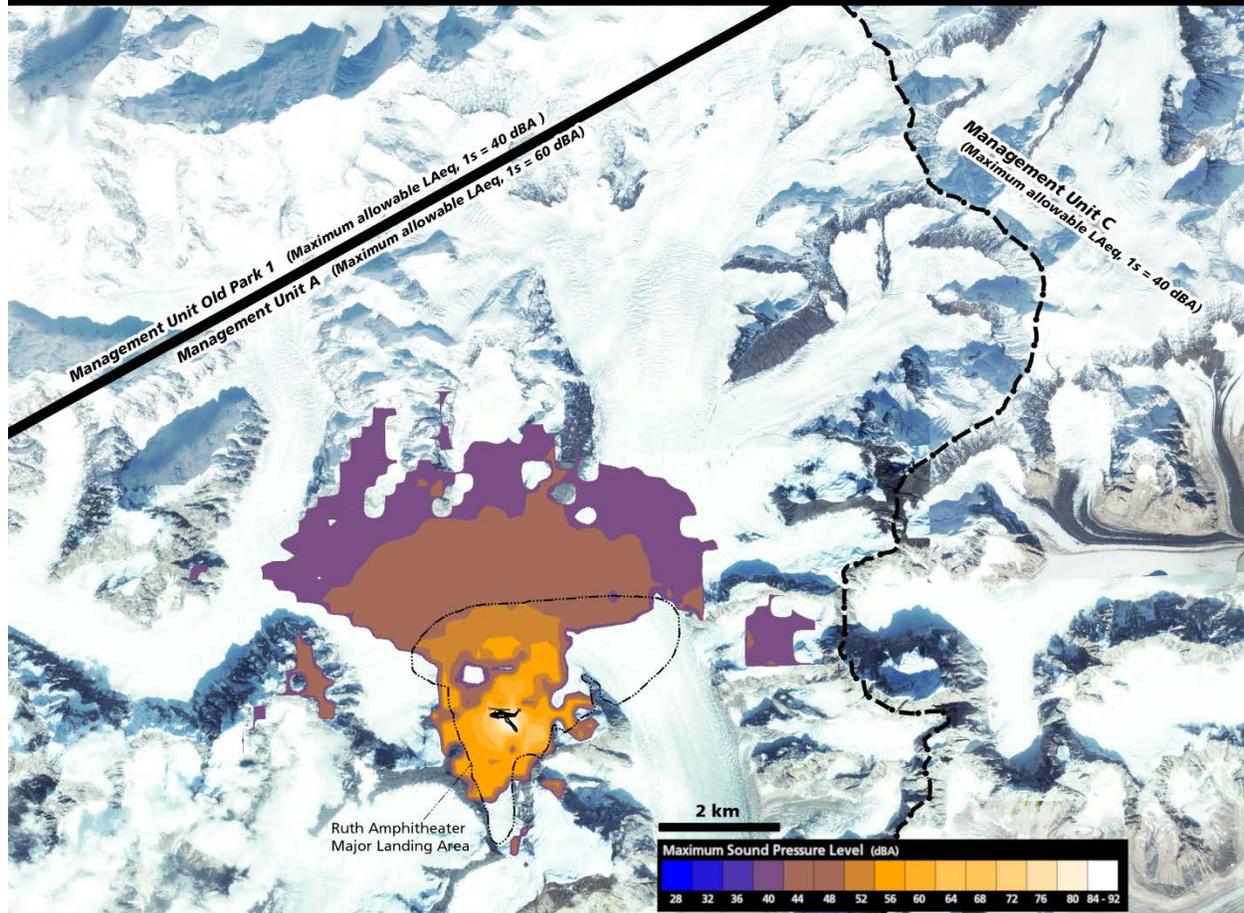


Figure 5. Map of noise predicted to spread into Denali National Park from helicopter cargo transport operations. Noise footprint is clipped to the 40 dBA Denali BCMP standard for Management Unit *Old Park 1*. The trajectory used in the model is represented as a small line to the southeast of the helicopter icon.

Acoustical modelling suggests that no matter the method used to conduct helicopter transport, operations in the vicinity of the Ruth Amphitheater site would exceed the BCMP standard. Over a typical sampling period we expect Alternative 2 to result in an increase of +0.8 of noise events out of compliance with the SPL standard, increasing exceedance from 40.9% (No Action) to about 41.7% of events. This analysis does not take into account increased traffic due solely to helicopter passenger transportation to and from the Mountain House, the rates of which are unknown to the NPS and are speculative to all parties at this time based on the newness of the expanded business venture.

If snowmachines are used in Alternatives 1 or 3 to accomplish cargo transport activities, they would have less impact on the acoustic environment due to their lower power: a snowmachine has a sound power level of ~110 dBA (Zhuang 2012) while helicopters are nearer to 130 dBA. This is a factor of 100 times more acoustic power.

Noise Predicted From AS350 Helicopter

Maximum Sound Pressure Level of event down to Unit A Standard (60 dBA)

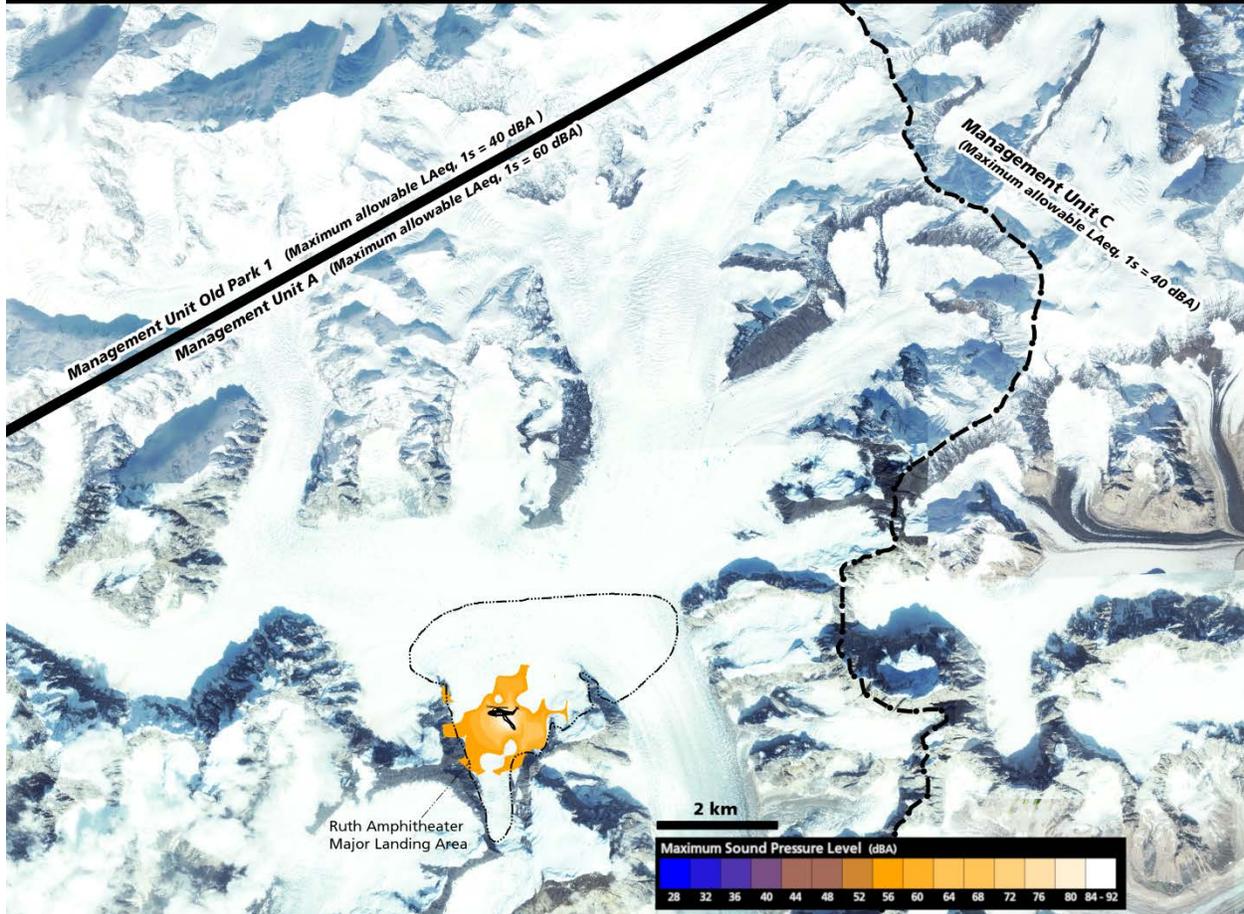


Figure 6. Map of noise predicted to spread into Denali National Park from helicopter cargo transport operations. Noise footprint is clipped to the 60 dBA Denali BCMP standard for Management Units A and C. The trajectory used in the model is represented as a small line to the southeast of the helicopter icon.

Summary

The following summary of acoustic impacts contrasts the three alternatives presented in the EA. To protect the natural acoustic environment the least-impactful course of action is Alternative 1 (No Action) or Alternative 3, *given* that the choice would result in increased reliance on snowmobiles by Mountain House LLC to transport cargo from the airstrip to their private parcel.

If not, and helicopters would still be utilized by Mountain House LLC to directly transport cargo from Talkeetna to their private helipad, Alternatives 1 or 3 would not be the least impactful. In that case, Alternative 2 would have equivalent acoustic impacts and become the preferred alternative to protect the natural acoustic environment. Sling-loading is expected to maximize compliance with the Denali BCMP in such a scenario. These conclusions are summarized in Table 5.

Note that in every alternative the Ruth Amphitheater area would remain out of compliance with BCMP standards for every acoustic indicator.

Table 5. Summary of acoustic impacts from various Alternatives.

Management Scenario	Percent Time Audible	Events Per Day	Sound Pressure Level	Down-Glacier Conditions
Alternative 1: No Action	<i>Impacts cannot be estimated without knowledge of expected use of helicopters or snowmachines to transport cargo directly to the private parcel.</i>	Similar to Alts 2 and 3	<i>If helicopter, similar to Alts 2 and 3. If snowmobile, less impact than Alt 2, same as Alt 3.</i>	<i>If helicopter, likely more impactful than Alt 2 due to additional flights required directly to private parcel from Talkeetna. If snowmobile, no impact down-glacier.</i>
Alternative 2: RWCA + SUP	<i>If sling-loading: +0.8% of hours out of compliance with BCMP For comparison with dismissed alternative: If hot-loading: +35.4% of hours out of compliance with BCMP</i>	No change in compliance for Management Unit A. Contributes to impacts in Management Unit Old Park 1, ~5 miles away	+0.8% of noise events out of compliance with BCMP	Impacts on approach and return legs of flight.
Alternative 3: RWCA only	Same as Alt 1	Same as Alt 1	Same as Alt 1	Same as Alt 1

References

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RWCA TEMPLATE
ANILCA 1110(b) Right-of-Way Certificate of Access (RWCA)

National Park Service Alaska Region 240 West 5th Avenue, Room 114 Anchorage, Alaska 99501	RWCA No.: _____ Park Unit
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1. An ANILCA 1110(b) Right-of-Way Certificate of Access (hereinafter “RWCA”) is hereby issued pursuant to Section 1110(b) of the Alaska National Interest Lands Conservation Act (ANILCA) of December 2, 1980 (16 USC 3170).

2. This RWCA provides access across National Park Service (hereinafter NPS) managed lands in _____ National (Park and Preserve) to the following non-federal land:

U.S. Survey _____, _____ Recording District, _____ Judicial District, State of Alaska. Also identified as NPS tract (sample: WRST 10-113).

3. Nature of Interest:

a. By this instrument _____ (Holder’s Name) (hereinafter “Holder”), whose address is _____, receives a right to construct, operate, use, maintain, and maintain a _____ (road, trail, airstrip, etc.) on NPS managed lands in _____ (NPS Unit Name) and within an area described as follows:

(Description of area of use authorized by RWCA)

Located in Section(s) _____, Township _____, Range _____, _____ Meridian, Alaska.

The area of use authorized by this RWCA is illustrated on the attached map(s) (Exhibit B).

b. The area authorized by this RWCA is _____ feet wide, _____ feet long, and contains _____ acres, more or less, and consists of _____ acres.

c. This RWCA shall not be construed as an interest in the land authorized for use by this RWCA, or as an abandonment of use and occupancy by the United States, but shall be considered a use of the land as described, anything contained herein to the contrary notwithstanding. This RWCA shall not be construed as an interest in water or a water right, or as an abandonment of water use by the United States.

d. The stipulations, plans, maps, or designs set forth in Exhibit(s) _____, dated _____, attached hereto, are incorporated into and made part of this instrument as fully and effectively as if they were set forth herein in their entirety.

4. Rental Fee. No rental fees apply because it is NPS policy not to charge fees when a requested use involves exercise of a right (not a privilege).

5. General Terms and Conditions:

a. The Holder shall comply with all applicable State and Federal law and existing regulations in the construction, operation and/or maintenance within the area authorized by this RWCA. It is the responsibility of the Holder to obtain any permits or other authorizations that are required by other governmental entities for the uses authorized by this RWCA.

b. This RWCA will continue in perpetuity until it is no longer needed for the purposes for which it is issued. Unless, prior thereto, it is relinquished, abandoned, or modified pursuant to the terms and conditions of this instrument or of any other applicable federal law or regulation.

c. This RWCA may be amended to adjust the terms and conditions for changed conditions, to correct oversights, or to address conditions not previously contemplated. Either the NPS or Holder may initiate an amendment by notifying the other in writing and providing a justification for the proposed revision or supplement. Amendments by mutual consent of the NPS and Holder may occur, but the NPS may also require an amendment without the consent of the Holder if uses within the area authorized by this RWCA or other conditions become inconsistent with the regulatory standards of Title 43 CFR 36.9 and 36.10(e)(1). The NPS will consult with the Holder when any amendment is initiated. Any amendment must result in the Holder continuing to have adequate and feasible access to his/her property.

d. The Holder shall perform all operations in a good and workmanlike manner so as to ensure protection of the environment and health and safety of the public.

e. This RWCA is for the purpose of providing the Holder with access across NPS lands to his/her non-federal land or valid occupancy. It does not authorize the Holder to use the area authorized by this RWCA for any activities other than access.

f. This RWCA may be assigned. The proposed assignee must state in writing that he/she agrees to comply with and to be bound by the terms and conditions of the existing RWCA. With such a written statement from the proposed assignee, the NPS Regional Director will approve the assignment of the RWCA to the assignee, who shall become the Holder. The assignment becomes effective upon the written approval of the NPS Regional Director, Alaska Region.

g. The Holder shall take adequate measures as directed and approved by the superintendent of the NPS unit to prevent or minimize damage to resources. This may include restoration, soil conservation and protection measures, landscaping with indigenous grasses and shrubs, and repairing roads, trails, etc. The superintendent or his/her representative may enter and inspect the area authorized by this RWCA and any facilities in it, as deemed necessary by the NPS and without restriction.

- h. The Holder will halt any activities in the area authorized by this RWCA and notify the superintendent of the NPS unit upon discovery of archeological, paleontological or historical artifacts. All artifacts unearthed remain the property of the United States.
- i. Use of pesticides or herbicides is prohibited within the area authorized by this RWCA.
- j. Use by the Holder is subject to the right of the NPS to establish trails, roads, and other improvements and betterments over, upon or through the area authorized by this RWCA. Also, at the discretion of the NPS, the area authorized by this RWCA may be open to use by the public and others. If it is necessary for the NPS to exercise such right, every effort will be made by the NPS to refrain from unduly interfering with use of this area by the Holder for the purposes intended under this RWCA. The Holder agrees and consents to the occupancy and use by the NPS and by individuals and entities authorized by the NPS, of any part of the area authorized by this RWCA. The Holder's right to "adequate and feasible access" under Title XI of ANILCA will be respected by the NPS.
- k. No deviations from the locations authorized in this RWCA shall be undertaken without the prior written approval of the superintendent of the NPS unit. The superintendent may require the filing of a new or amended application for a proposed deviation.
- l. Notwithstanding the relinquishment or abandonment of this RWCA by the Holder, the provisions of this RWCA, to the extent applicable, shall continue in effect and shall be binding on the Holder, its successors, or assigns, until they have fully satisfied the obligations and/or liabilities accruing herein.
- m. Upon revocation, including revocation based upon a finding that this RWCA is no longer needed for the purposes for which it was issued, in the absence of any agreement to the contrary, the Holder will be allowed six (6) months or such additional time as may be granted in which to remove from the area authorized by this RWCA all property or improvements of any kind, other than a road and usable improvements to a road, placed thereon by the Holder; but if not removed within the time allowed, all such property and improvements shall become the property of the United States.
- n. Upon revocation, including revocation based upon a finding that this RWCA is no longer needed for the purposes for which it was issued, the Holder may be required by the NPS to restore the NPS lands affected by the RWCA to conditions reasonably existing before Holder's modifications to the RWCA.
- o. This RWCA has no effect on any valid existing rights of access pursuant to any other authority.
- p. The Holder agrees that in undertaking all activities pursuant to this RWCA, it will not discriminate against any person because of race, color, religion, sex, or national origin.

q. No member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this RWCA or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this RWCA if made with a corporation for its general benefit.

r. This agreement is made upon the express condition that the United States, its agents and employees shall be free from all liabilities and claims by the holder for damages and/or suits for or by reason of any injury, or death to any person or property of any kind whatsoever, whether to the person or property of the Holder, its agents or employees, or third parties, from any cause or causes whatsoever while in or upon said premises or any part thereof during the term of this agreement or occasioned by any occupancy or use of said premises or any activity carried on by the Holder in connection herewith, and the Holder hereby covenants and agrees to indemnify, defend, save and hold harmless the United States, its agents and employees from all liabilities, charges, expenses and costs on account of or by reason of any such injuries, deaths, liabilities, claims, suits or losses however occurring or damages growing out of the same.

s. Any alterations to this instrument must be in writing and signed by the NPS and Holder.

t. Nothing herein contained shall be construed as binding the NPS to expend in any one fiscal year any sum in excess of appropriations made by Congress or administratively allocated for the purpose of this RWCA for the fiscal year, or to involve the NPS in any contract or other obligation for the further expenditure of money in excess of such appropriations or allocations.

u. The waiver of any breach of any provision of this RWCA, whether such waiver be expressed or implied, shall not be construed to be a continuing waiver or a waiver of, or consent, to any subsequent or prior breach of the same or any other provision of this RWCA.

v. Failure to comply with permit terms and conditions may result in criminal or civil liability, and/or modification or revocation of the permit.

IN WITNESS WHEREOF, the Regional Director, Alaska Region of the National Park Service, acting on behalf of the United States, in the exercise of the delegated authority from the Secretary of the Department of the Interior, has caused this ANILCA 1110(b) Right-of-Way Certificate of Access (RWCA _____) to be executed this ____ day of _____, 20__.

Regional Director, Alaska Region
National Park Service
United States Department of the Interior

ACCEPTED this ____ day of _____, 20__.

Printed name of Holder

Signature of Holder

1. The permittee is prohibited from giving false information; to do so will be considered a breach of conditions and be grounds for revocation: [36 CFR 2.32(a)(3)].
2. The permittee shall exercise this privilege subject to the supervision of the Superintendent or designee, and shall comply with all applicable Federal, State, county and municipal laws, ordinances, regulations, codes, and the terms and conditions of this permit. Failure to do so may result in the immediate suspension of the permitted activity or the termination of the permit.
3. If any provision of this permit shall be found to be invalid or unenforceable, the remainder of this permit shall not be affected and the other provisions of this permit shall be valid and be enforced to the fullest extent permitted by law.
4. The permittee is responsible for making all necessary contacts and arrangements with other Federal, State, and local agencies to secure required inspections, permits, licenses, etc.
5. Failure to comply with any of the terms and conditions of this permit may result in the suspension or revocation of the permit. Permittee will reimburse NPS for cleanup or repair of damages required to be made by NPS staff or contractor in conjunction with a terminated permit.
6. This permit may be revoked at the discretion of the Superintendent upon 24 hours notice, or without notice if damage to resources or facilities occurs or is threatened, notwithstanding any other term or condition of the permit to the contrary.
7. This permit is made upon the express condition that the United States, its agents and employees shall be free from all liabilities and claims for damages and/or suits for or by reason of any injury, injuries, or death to any person or persons or property of any kind whatsoever, whether to the person or property of the Permittee, its agents or employees, or third parties, from any cause or causes whatsoever while in or upon said premises or any part thereof during the term of this permit or occasioned by any occupancy or use of said premises or any activity carried on by the Permittee in connection herewith, and the Permittee hereby covenants and agrees to indemnify, defend, save and hold harmless the United States, its agents, and employees from all liabilities, charges, expenses and costs on account of or by reason of any such injuries, deaths, liabilities, claims, suits or losses however occurring or damages growing out of the same.
8. Permittee agrees to carry general liability insurance against claims occasioned by the action or omissions of the permittee, its agents and employees in carrying out the activities and operations authorized by this permit. The policy shall be in the amount of \$500,000 and underwritten by a United States company naming the United States of America as **additionally insured**. The permittee agrees to provide the Superintendent with a Certificate of Insurance with the proper endorsements prior to the effective date of the permit.
9. Costs incurred by the park as a result of accepting and processing the application and managing and monitoring the permitted activity will be reimbursed by the permittee. Administrative costs and estimated costs for activities on site must be paid when the permit is approved. If any additional costs are incurred by the park, the permittee will be billed at the conclusion of the permit. Should the estimated costs paid exceed the actual costs incurred; the difference will be returned to the permittee.
10. The person named on the permit as in charge of the permitted activity on-site must have full authority to make any decisions about the activity and must remain on-site at all times. He/she shall be responsible for all individuals, groups, vendors, etc. involved with the permit

11. The permittee represents and it is a condition of acceptance of this permit that, pursuant to 41 U.S. C. 22, "No Member of Congress shall be admitted to any share or part of any contract or agreement made, entered into, or accepted by or on behalf of the United States, or to any benefit to arise thereupon."
12. Nothing herein contained shall be construed as binding the Service to expend in any one fiscal year any sum in excess of appropriations made by Congress or administratively allocated for the purpose of this permit for the fiscal year, or to involve the Service in any contract or other obligation for the further expenditure of money in excess of such appropriations or allocations.
13. This permit may not be transferred or assigned without the prior written consent of the Superintendent.

Additional park specific conditions

14. Credit must not state or imply National Park Service endorsement of commercial product
15. Permittee shall own all rights of every kind in and to all photographs and recordings made by it in the park and shall have the right to use such photographs and/or recordings in any manner it may desire without limitation or restriction of any kind. Permit does not grant any rights regarding the filming, photography or recording of individuals on National Park Service property. In addition, rights owned by other individuals or institutions are not impacted or changed by this permit.
16. No employee of the National Park Service may work for the permittee in any capacity whatsoever while in uniform or if directly involved in supervision of the permittee.
17. NPS employees may not perform, or appear to perform official duties for purposes of filming unless such performance has been approved by the NPS.
18. This permit does not guarantee exclusive use of an area. The area will remain open to the public during park visiting hours. Permit activities will not unduly interfere with other park visitors' use and enjoyment of the area. Visitors will be allowed to watch filming.
19. Conditions/prohibitions on attaching anything to NPS facilities, structures, rocks or vegetation, hanging signs or banners, prohibitions/restrictions on mylar or helium balloons.
20. Prohibition on digging, scraping, moving natural features. Cutting of branches or ground cover is not permitted.
21. Conditions/prohibitions on camouflage or removal of signs, fences, posts, etc.
22. The use of drones is prohibited in all areas of Denali National Park (as per 36 CFR 13.5).
23. Distances from wildlife: All park visitors including permittees are required to adhere to these regulations:

Bears. The following is prohibited:
(i) Approaching a bear within 300 yards; or
(ii) Engaging in photography/filming within 300 yards of a bear.

Other wildlife. The following is prohibited:

- (i) Approaching a moose, caribou, Dall sheep, wolf, an active raptor nest, or occupied den site within 25 yards; or
- (ii) Engaging in photography/filming within 25 yards of a moose, caribou, Dall sheep, wolf, an active raptor nest, or occupied den site.

The prohibitions in this section do not apply to persons— (i) Within a motor vehicle or a hard sided building;

(ii) Within 2 yards of their motor vehicle or entrance to a hard sided building that are 25 yards or more from a bear.

- 24. Intentional harassing, disturbing, or feeding of wildlife is prohibited by Federal Regulation. “Harassment” is defined as "any human action that causes unusual behavior or significant change of behavior by an animal". “Disturbance” is defined as “to intrude upon or interfere with”. A professional wildlife photographer/film crew is responsible for knowing the point at which human presence becomes harassment. If you are disturbing or harassing an animal, you **must leave** the area immediately. While each individual encounter may seem inconsequential, the cumulative effects caused by repeated encounters may result in critical behavior change. Examples are missed feedings, failed attempts by ewes and lambs to cross the road, habituation, increased risk of predation, etc. The welfare of the subject is more important than the photograph or film.
- 25. Moving animals must not be blocked or pursued by vehicles or on foot.
- 26. Attracting animals with food, calls or scents, using blinds, or altering vegetation around photographic subjects is **strictly prohibited!**
- 27. Bears, wolves, foxes or other predators or scavengers will not be disturbed or chased from carcasses. Do not approach any animal feeding on a carcass.
- 28. Allowing a wolf, fox, or bear to approach you or investigate property (i.e. your gear, tripods, cameras, backpack, food containers, or water bottles) increases the potential for them to obtain human food and the risk of these animals developing unnatural behavior. Attempt to dissuade the animal by yelling and/or stomping your feet. Report the incident to the Backcountry Information Center or any park ranger. Do not leave gear and articles scattered around your vehicle as it may encourage curious animals to investigate. Keep your gear secured and stored as neatly as possible.
- 29. Beaver dams and lodges will not be disturbed, including walking or standing on the structures.

Appendix E: Other Images



Image 1 - South end of nunatak. Note green line depicting general property boundary. Stairs currently sited entirely on private parcel. Request is to change stairs such the lower flight of steps departs from landing (by US flag) depicted in photo and ends near the South Nunatak Cargo Area.

Photo: Robert Sheldon, boundary location estimated by NPS

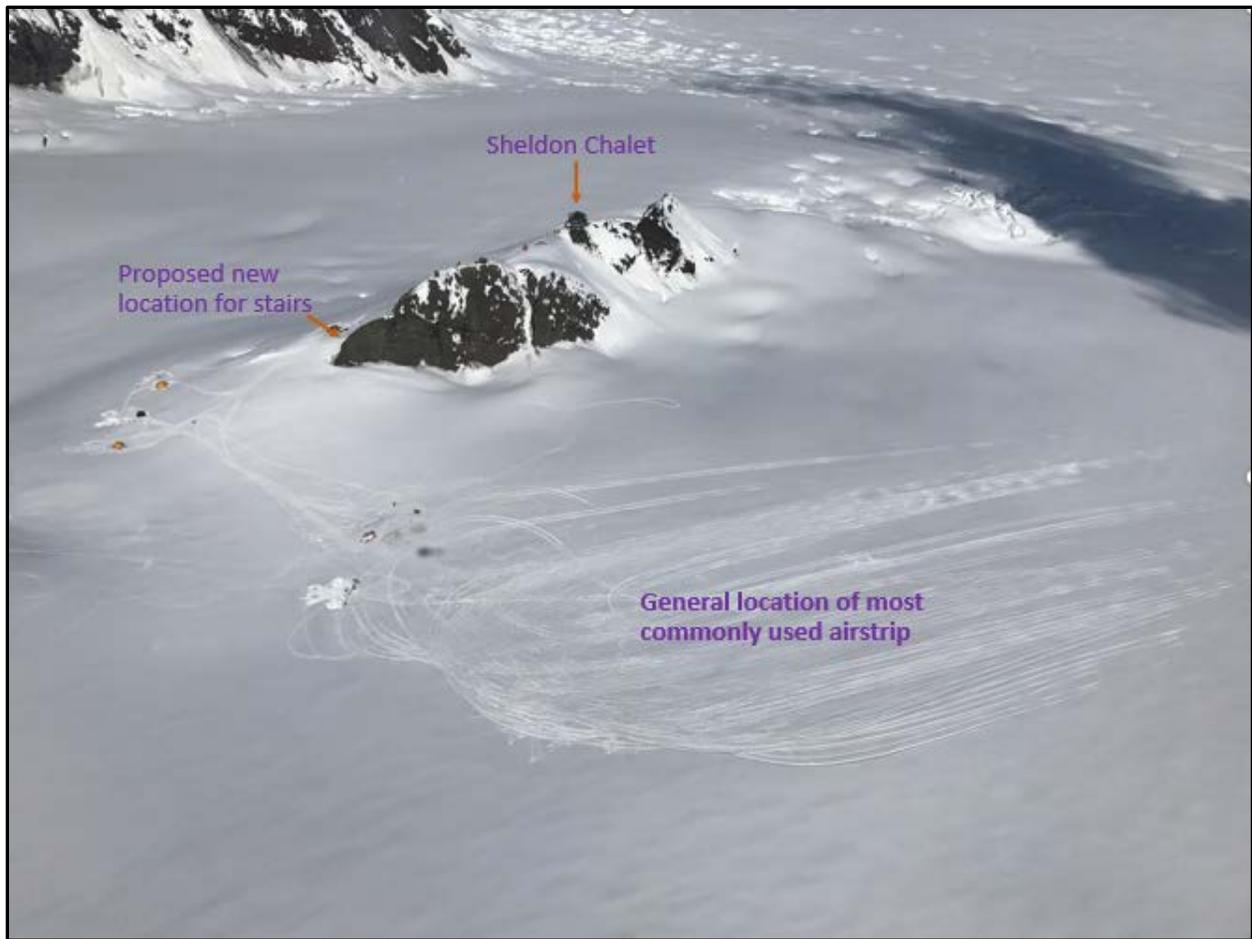


Image 2 – Aerial view of project area including east landing strip and nunatak. Photo: NPS

Map 2 - Sheldon Parcel and Proposed Infrastructure
Denali National Park and Preserve

Alaska Region
National Park Service
U.S. Department of the Interior



Image 3 – Similar to Figure 2 in body of EA; a larger area is shown here including the approximate location of landing strips.



Image 4 – General type of storage tote proposed. Proposed size is approximately 36” x 48” x 30”



Image 5 – Sling load operation, Alaska Range. Photo: NPS