

ENVIRONMENTAL ASSESSMENT
Document No.: AK-040-02-EA-011

Applicant(s): Out of Bounds Adventures (Case File AA-81641)
Alaska Heliskiing
P.O. Box 020862
Juneau, Alaska 99802

Southeast Backcountry Adventures (Case File AA-83491)
Scott Sundburg
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Teton Gravity Research (Case File AA-83537)
Jim Conway/Dirk Collins
1579 East Sherleen Circle
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Type of Action: Special Recreation Permits (Commercial Heli-skiing Tours) and
Commercial Filming Permits

Location: Areas West of Haines, Alaska and areas North and West of Skagway,
Alaska.

The following legal descriptions include all areas being analyzed:

T. 24 S., R. 57, 58 E.
T. 25 S., R. 58 E.
T. 25 S., R. 57 E., Secs. 25-36
T. 26 S., R. 57 E., Secs. 1-2, 11-12, 13-36
T. 27 S., R. 57 E., Secs. 1-3, 10-16, 21-25
T. 30 S., R. 54 E., Secs. 1-2, 7, 11-12, 17-29
T. 30 S., R. 55 E., Secs. 19-36
T. 30 S., R. 56 E., Secs. 1-6, 10-12, 26-36
T. 30 S., R. 57 E., Secs. 9, 16, 17
T. 31 S., R. 55 E., Secs. 1-5, 8,9
T. 31 S., R. 56 E., Secs. 1-12
T. 31 S., R. 57 E., Secs. 1-29, 33-36

The following legal descriptions apply specifically to filming locations
being analyzed:

T. 24 S., R. 57 E., Secs. 24, 25
T. 24 S., R. 58 E., Secs. 19, 29-33
T. 25 S., R. 57 E., Secs. 7, 8, 13, 15-18, 20-22, 24-28, 33-36
T. 25 S., R. 58 E., Secs. 1, 2, 8-27, 30, 35-36
T. 25 S., R. 59 E., Secs. 6, 7, 17-20, 29-32

T. 26 S., R. 56 E., Secs. 2, 9-27, 20-28, 34-36
T. 26 S., R. 57 E., Secs. 1-2, 11-13, 15, 16, 18-23, 25-34
T. 26 S., R. 58 E., Secs. 3-6, 13, 14, 23-25, 36
T. 26 S., R. 59 E., Secs. 5-9, 15-23, 26-35
T. 27 S., R. 56 E., Secs. 1, 8-10, 15-17, 19-23, 26-30, 32-36
T. 27 S., R. 57 E., Secs. 4, 5, 13, 14, 16, 17, 19-33, 36
T. 27 S., R. 58 E., Secs. 3-5, 9-16, 19, 22-27, 30-32, 35, 36
T. 27 S., R. 59 E., Secs. 3-5, 8-0, 15, 16, 18-22, 27-33
T. 28 S., R. 56 E., Secs. 1-4, 9-15, 22-26
T. 28 S., R. 57 E., Secs. 1, 6-8, 17-19
T. 28 S., R. 58 E., Secs. 1, 2, 5-8, 12, 17, 18
T. 28 S., R. 59 E., Secs. 6, 7
T. 30 S., R. 53 E., Secs. 11-14, 23-26
T. 30 S., R. 54 E., Secs. 15-36
T. 30 S., R. 55 E., Secs. 19-36
T. 30 S., R. 56 E., Secs. 19, 27-36
T. 30 S., R. 57 E., Secs. 31-33
T. 31 S., R. 55 E., Secs. 1-6, 8, 9
T. 31 S., R. 56 E., Secs. 1-4, 6, 10-15, 24
T. 31 S., R. 57 E., Secs. 4-9, 17-20

All land descriptions are within the Copper River Meridian.

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Date: April 25, 2002

I. INTRODUCTION

A. Purpose and Need for the Proposed Action:

Out of Bounds Adventures Alaska Heliskiing and Southeast Backcountry Adventures wish to offer helicopter assisted, commercially guided alpine skiing trips (heliskiing) on Bureau of Land Management (BLM) administered lands. Clients also include commercial film companies. In some cases, the applicants are hired by film companies to safely guide them to optimum filming locations. They currently offer the same services under permit with the U.S. Forest Service (USFS) on the Tongass National Forest. These are the only companies offering this type of service in Southeast Alaska. The proposed services will meet anticipated public demand for quality guided heliskiing in the Haines area. This environmental assessment (EA) will address heliskiing and commercial filming and photography activities.

Film companies, such as Teton Gravity Research (TGR), must apply for a land use permit required by the Code of Federal Regulations (CFR). A land use permit provides a short-term revocable authorization to use public lands for specified purposes. For heliskiing, the commercial guiding and commercial filming operations are similar in nature, although the end product is different. Commercial guides offer a service, whereas commercial filming results in a film or photographic product. The reason for this combined Proposed Action is to ensure consistency and address cumulative impacts for all heliskiing operations and other activities on BLM administered lands in Southeast Alaska.

B. Conformance With Land Use Plan:

No land use plan exists for this area. However, this environmental analysis assesses the impacts of the Proposed Action and provides a basis for a decision on the proposal (43 CFR 1610.8 (b)(1)).

C. Relationship to Statutes, Regulations, or Other Plans:

Applicants must obtain a State of Alaska business license and the aircraft utilized must have the appropriate licenses and certificates from the Federal Aviation Administration (FAA). Permit holders are required to abide by all federal, state, borough or municipal laws, ordinances and regulations which are applicable to the areas or the operations covered in the permit. Any future state, borough or federal permitting requirements that may be developed will automatically become a requirement of any BLM permit.

The BLM does not have jurisdiction to regulate aircraft flight paths, altitudes or noise caused by aircraft overflights or flight seeing operations. BLM may regulate landing locations, number of landings and on-the-ground commercial activities on

BLM administered lands. En route flight operations may be indirectly influenced by requiring certain standards to be met as a condition of receiving a permit.

The airports in Haines and Skagway are un-towered and under jurisdiction of the FAA. The Flight Standards Division of the FAA is responsible for all flight operations (including safety) in controlled and uncontrolled airspace.

The CFRs for the FAA and the Department of Transportation Volume 14, Chapter 1, Part 135.203 states: "Except when necessary for take-off and landing, no person may operate under visual flight rules (VFR) a helicopter below 300 feet above the surface or less than 300 feet horizontally from any obstacle".

A BLM Special Recreation Permit (SRP) regulates commercial recreation services on BLM administered land and related water pursuant to 43 CFR 8372. As the lands described in the applications are selected by the State of Alaska, a concurrence in accordance with Section 906(k) of the Alaska National Interest Lands Conservation Act (ANILCA) is required for recreation permits. The State of Alaska has determined that commercial filming is an allowed activity that is permissible on state lands without a permit and concurrence for a filming permit is not required. The State of Alaska has requested to review the land use permit prior to final authorization.

Public Law 106-206 of May 2000, allows the Secretary of the Interior to require a permit and to establish a fee system for commercial filming activities on public lands and for other purposes. When filming commercially, a permit is required under regulations found in 43 CFR 2920.

The Coastal Zone Management Act requires the BLM, when consulting or authorizing activities or undertaking development directly affecting the coastal zone, to insure that the activities or development are consistent with the approved Alaska Coastal Management Program to the maximum extent practical. The activities under the Proposed Action are consistent with the Alaska Coastal Management Program.

Refer to EA-AK-040-95-015, Environmental Assessment for Helicopter Landing Tours in the Skagway and Haines Area, pages 1-10, H. through 1-12 (Appendix 1), for further information on other required laws and permits pertaining to jurisdiction and regulation of helicopter flight paths, altitudes or noise caused by helicopters.

II. PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action:

Actions Common to All Applicants

Heliskiing operation areas will include predominantly north facing slopes in high alpine areas in order to avoid mountain goat late winter habitat use areas and populations. Flight routes have been designed to avoid to the greatest extent possible known goat wintering habitat with an appropriate buffer zone established for protection. Flight routes closer to Haines will adhere to local traffic patterns (see attached map). Upon departing Haines, altitude gains should be over Taiya Inlet and mild terrain. Altitude gains or losses to all helicopter landing sites are made prior to flying up or down drainages. All landing sites for dropping off skiers are between 3,000 and 5,500 feet primarily on north facing slopes. Some documented pick up sites extend to as low as 1,000 feet above sea level. Flight descents to pick-up skiers will be made outside of the sensitive wildlife habitat areas to avoid flying near goat wintering habitat.

An EA on Helicopter Glacier Landing Tours (EA-AK-040-95-015) was completed on May 10, 1995, which analyzed impacts of summer helicopter use in the same area. The mitigation measures adopted in the Decision Record of that document are incorporated in the Proposed Action.

Out of Bounds Adventures

Out of Bounds Adventures is based in Juneau, Alaska. They propose to conduct heliskiing operations on public land with helicopters (American Eurocopter, A-Star 350B-2). Flights would occur from both the Haines airport and a private facility located at mile 33 of the Haines Highway.

The operation season is from March 1st to April 30th. They have requested a maximum of 400 user days during this time period. Helicopter group size and on-the-ground client to guide ratio is 5 to 1. It is anticipated there will be as many as four groups of five skiers, plus their guides, each day. There will be two helicopters in operation with two groups of skiers with each helicopter. There is the possibility of a third helicopter, but this helicopter would operate on state managed lands only. Typically, early season (March) operations are with only one helicopter.

Clients and guides will be dropped off at a selected site for skiing. At the end of the ski run, they will be picked up by the helicopter and returned to the top of the run or another site. This scenario is repeated five or six times per day, per group. This equates to a potential of five or six different basins being exposed to helicopter activities per day. With two helicopter landings per run, there will be

approximately 10 to 12 landings per day, per group or a total of 40 to 48 landings per day for all four groups. The average time spent on BLM lands for the daily operation is projected at two to four hours per day. Operation hours will be between the hours of 8:00 a.m. and 6:00 p.m.

Clients will have a daily briefing prior to skiing. Pre-flight information will be read, explained and demonstrated to all clients. The clients also receive extensive training on the use of avalanche rescue, including avalanche beacon and transceiver use. All guides are trained as Level I heliguides and certified by the Southeast Alaska Avalanche Center.

Southeast Alaska Backcountry Adventures

Southeast Alaska Backcountry Adventures (SEABA) is based out of Haines, Alaska. Owner, Scott Sundburg and staff propose to conduct heliskiing operations on public land with helicopters (American Eurocopter, A-Star 350B-2). All flights would originate and terminate in Haines, Alaska or a staging area set up at mile 33 of the Haines Highway.

The operation season is from February 15th to April 30th. They estimate 150 user days during this time period. Helicopter group size and on-the-ground client to guide ratio is 5 to 1. It is anticipated there will be as many as four groups of five skiers, plus their guides, each day. With two helicopters in operation, there will be two groups of skiers with each helicopter. There is the possibility of a third helicopter, but this helicopter would operate on state managed lands only.

Typically, clients and guides will be dropped off at a selected site for skiing. At the end of the ski run, they will be picked up by helicopter and returned to the top of the run or another site. This scenario is repeated five to six times per group per day. With two helicopter landings per run, there will be approximately 10 to 12 landings per day, per group or a total of 40 to 48 landings per day for all four groups. The average time spent on BLM lands for the daily operation is projected at two to four hours per day. Operation hours will be between the hours of 8:00 a.m. and 6:00 p.m.

Clients will have a daily briefing prior to skiing. Pre-flight information will be read, explained and demonstrated to all clients. The clients also receive extensive training on the use of avalanche rescue, including avalanche beacon and transceiver use. All guides are trained as Level I heliguides and certified by the Southeast Alaska Avalanche Center.

Teton Gravity Research

Teton Gravity Research is an independent film company based out of Teton Village, Wyoming, with an office in Salt Lake City, Utah. TGR proposes to film professional ski and snowboard athletes in approved areas of the high remote north facing peaks of the Chilkat Range, west and north of Haines, Alaska. A helicopter is used to access these high alpine areas with a crew of up to 12 including: pilot (1), guides (2), cinematographers (2-3), still photographers (2), and professional athletes (4-5). Base staging and refueling takes place at the Haines Airport and on private property.

TGR proposes to only access lands on a temporary basis, weather permitting. TGR is applying for two to five days of filming and two to five days of reconnaissance flights for the month of April. Filming is accomplished on sunny days, and reconnaissance may be performed on overcast or cloudy days to assess snowpack safety. A typical filming day includes 8 to 12 lifts. The number of landings would be approximately 30 landings per day for 4 to 10 days or 120 to 300 total.

No permanent or temporary structures or improvements are required. Actual filming of the athletes is performed from the same slope, adjacent slope, and/or from the helicopter. Filming will be done with hand held cameras, and may include setting up a tripod.

TGR will avoid filming in a location with other heliskiing or touring parties. The filming operation will be moved at least one drainage away from any touring party within the permitted area.

Monitoring control and sensitive wildlife habitat areas will be observed. In addition, all wildlife sighted outside of these areas will be avoided by a one mile or designated distance buffer. Once wildlife are sighted, the operations will move at least one mile (or designated distance) or one drainage away from the wildlife so adequate visual and auditory barriers can be maintained between flight operations and wildlife. Guides will record all wildlife and heliskiing or touring party sightings, and provide the information to BLM.

TGR will pack out everything they pack in, including human waste. They have offered to give BLM a location credit in their film. TGR will follow the skiing and scouting procedures in their Film Operations and Safety Plan. A copy is in the case file.

B. No Action Alternative:

The No Action Alternative would be to continue present management and not authorize increased commercial heliskiing and filming on BLM administered lands. The No Action Alternative would allow established historical use to continue on these federal lands and may cause a shift in use to other federal or state lands.

III. AFFECTED ENVIRONMENT

All of the land described in the Proposed Action has been selected by the State of Alaska as part of its entitlement at statehood. BLM is responsible for management of the land until it is conveyed to the State or the selections are relinquished.

The intended use areas are predominantly above tree line. However, some proposed runs are on avalanche chutes that interrupt timber belts down to less than 1,000 feet above sea level. Landing areas are predominantly north facing slopes within the described legal descriptions that are determined to be accessible for safe client drop-off and pick-up and free of any danger from crevasses or avalanches. Some areas contain rugged bare rock outcrop islands which may serve as potential habitat for local goat populations.

See EA-AK-040-95-015, pages 3-16, E.4.a. through 3-18 E.4.e. for additional descriptions of glaciers in the area and the affected environment (Appendix 1).

A. Critical Elements:

It has been determined that the following Critical Elements of the human environment are either not present or would not be affected by the Proposed Action or the No Action Alternative:

- Areas of Critical Environmental Concern (ACECs)
- Cultural/Paleontological Resources
- Environmental Justice
- Farm Lands (prime or unique)
- Flood plains
- Invasive, Non-Native Plant Species
- Native American Religious Concerns
- T&E Species
- Wastes (Hazardous/Solid)
- Water Quality (Surface/Ground)
- Wetlands/Riparian
- Wild and Scenic Rivers
- Wilderness

1. Air Quality
Helicopters burn a substantial amount of fuel, approximately 30 gallons of jet fuel per hour. This will increase the emissions into the air over the operation area but because the area is so large, the increase in hydrocarbon emissions will not be detectable.
2. ANILCA Section 810 (a), Evaluation and Finding:
These lands are selected by the State of Alaska and therefore do not fall under the definition of Federal Public Lands under ANILCA 102 (3) or under the authority of the Federal Subsistence Board or Subsistence Management Regulations. Should the selection for these lands be relinquished, they would fall under the authorities of ANILCA Section 810 (a). Under such a scenario, all subsistence species of land animals would come under the responsibility of the Federal Subsistence Board for subsistence harvest. In times of shortages, the rural local residents would have priority for harvest of fish and game from Federal Public Lands and Waters. Commercial helicopter supported recreation could potentially create such shortages and impact the health of subsistence populations of wildlife. Commercial activities could be terminated or modified to insure healthy populations for subsistence uses.

B. Wildlife:

For additional discussion on the affected environment for wildlife see EA-AK-040-95-015, pages 3-16, E.4.a. through 3-18 E.4.e. (Appendix 1). This discusses the wildlife habitat within some of the potential heliski areas.

Landing areas are primarily those north facing slopes determined to be accessible for safe client drop-off and pick-up (see attached map). Most heliski areas will be in high alpine permanent and non-permanent snow fields or glaciers. Some of these large open areas have rugged bare rock outcrop islands which may serve as potential habitat for local goat populations, movement corridors to kidding areas in early spring and movement to spring foraging areas (April 10th to May 20th).

Goat wintering areas are very restricted and few alternate sites are available. In most winters, conditions do not allow for movement of goats to alternative habitats due to energy expenditure, extreme snow depths, and exposure to falls and avalanches.

Brown bear and black bear dens occur in the proposed operation areas. Females of both species typically select the highest, roughest country to protect cubs from being killed by male bears. Bears also utilize goat carrion in avalanche chutes and

actively hunt and feed on dispersing goats in the proposed heliski areas. Brown bear females with cubs and black bear adults have been observed in near proximity or stalking mountain goat groups in late June.

Wolverine populations are never considered abundant and natal dens are sparsely distributed. Wolverine natal dens are typically located on the kinds of terrain proposed for heliskiing. However, no den sites have been documented.

C. Recreation:

During the scoping meetings in 1995 for EA-AK-040-95-015, and at public meetings held in Haines in 2001, specific areas were identified by the public where the impact of aircraft noise could adversely affect recreationists, primarily back country skiers seeking solitude. The Proposed Action does not include any of these areas. There are no known hiking trails to the snow fields and glacial areas listed for the Proposed Action.

D. Socio-Economics:

The town of Haines has a seasonal tourism economy. Retail shops, restaurants, hotels, transportation and tours generate substantial income for the business community and tax revenues. Active tourism businesses support other sectors of the community through spin-off purchases. Heliskiing operations provide additional business support in an otherwise slow time of year. Most tourists pass through Haines from mid-May to September when large cruise ships arrive. Guiding operations and other tourism based on wildlife and wildlife viewing depend on the long term stability and maintenance of wildlife populations.

IV. ENVIRONMENTAL CONSEQUENCES

A. Impacts of the Proposed Action:

1. Wildlife:

Wildlife will experience two types of aircraft encounters. The first is from en route flight activity where helicopters are passing by wildlife and their habitats. The second is actual heliskiing operations where helicopters are landing and taking off for photo shoot setups, snow condition assessment and skiing activities.

En route flight routes could pass by mountain goats, brown bear, black bear, wolves, moose, and raptors engaged in a wide variety of activities, depending on time of year, time of day and location. Wildlife response will vary depending on distance to escape cover, terrain and duration of exposure. The short term exposure to noise and visual stimuli from helicopters en route is minimized with an adequate distance or buffer

maintained from the wildlife. Most species of wildlife become accustomed to aircraft stimuli (including helicopters) if the perceived threat is minimized by distance, short duration of exposure, repeated patterns of flight and avoidance of critical life cycle periods. Wildlife managers have established that the adequate separation distance for aircraft from wildlife in many circumstances is 1,500 feet and have applied this stipulation to permits in Canada.

The species most likely to be impacted by the Proposed Action would be mountain goats, especially in the third trimester of pregnancy and during dispersal to high quality foraging areas in early spring. Often impacts are not readily apparent in adult animals but may result in higher rates of aborting of young or newborn unable to handle the rigors of cold and wet spring conditions that die shortly after birth. Mountain goats are subject to high natural mortality and populations are sensitive to low recruitment rates. Mountain goats can be pushed below the threshold needed to maintain local populations with additive impacts that cause increased mortality and lower recruitment. Once the threshold is crossed, where recruitment does not offset mortality, the population begins a long process of fading away from which recovery is difficult. Impacts causing energy depleting movements through deep snow or stress episodes that deplete fat stores in late winter contribute toward increased mortality of individual animals. Impacts may include increased or forced competition as displaced animals move onto winter ranges already occupied to capacity and thereby overusing alternate habitats. These natural mortality factors are cumulative. If the impacts from helicopter supported recreation are not mitigated, the impacts could lead to the elimination of localized goat populations.

Mountain goats on late winter range (March and April), on kidding habitat (May 1 to June 15), and on isolated habitats such as land islands surrounded by snow and ice fields, may be the most stressed by helicopter activity. It is anticipated that helicopters passing 1,500 feet or more from mountain goats will cause little to no visible reaction such as a flight (running) response. However, little is known of the specific short or long term population stability, and physiological or behavioral impacts on mountain goats from aircraft.

Landing areas for dropping skiers off are mostly at the upper limits of goat habitat. However, some pick up sites are near observed goat habitat. For this reason, these sites must be managed closely to insure goat winter

habitat is buffered adequately. Some bare rock outcrops in ice fields may have small numbers of goats on them or such habitats may be utilized during dispersal from winter range sites to kidding areas and higher quality foraging sites during April and May. Goats access islands of habitat by crossing extensive ice fields and may occupy some year long. They would be most affected by nearby aircraft take-off procedures due to the sustained engine noise. The goats response would likely vary depending on distance of the rock island habitat from take-off and landing sites and how far goats are from such steep cover sites when stimulated. Size of group and makeup of groups is important in goat reaction. Nanny and kid groups appear much more reactive or sensitive to aircraft and also tend to venture further from cover to obtain sufficient quality feed. Repeated high numbers of take-offs near the rock islands could result in temporary or permanent displacement of animals

The importance of providing predator access to goat carcasses from accidental falls and avalanches as well as winter starvation is a critical element in early spring food sources for wolverines and bears. Access to goats by predators is also important as distribution and reduction in goat populations directly impact the maintenance of predator populations. During the early winter months, wolves prey on the mountain goats. Golden and bald eagles rely on mountain goat carrion, young lambs, and at times adults for a food source. The Chilkat Bald Eagle Preserve is near the area and has a high density of nesting bald eagles. The late winter, early spring nesting chronology of these birds is dependent in part on available carrion and high protein intake for successful breeding and hatching success. Reduction of localized goat abundance or carrion may directly impact population stability and reproductive success of these birds.

Female brown bears with new cubs are also vulnerable to being shifted to other locations by heliskiing caused disturbances. Relocating to different habitat could increase cub mortality by exposing them to interactions with male bears which will kill cubs.

There is additional discussion on the noise impacts to wildlife within EA-AK-040-95-015, pages 3-11, E.1. through 3-13 (Appendix 1).

2. Recreation:
Noise impacts to people participating in a variety of recreational activities (primarily back country skiing) in the use areas may increase. These areas

are also accessed by back country enthusiasts for recreation via chartered helicopters, fixed-wing aircraft or extended treks. The number of people in the area disturbed by helicopters or other aircraft is anticipated to be low, since most people access these areas by helicopter or other aircraft and are not sensitive to an occasional aircraft flying by or landing. TGR will avoid areas with other heliskiing parties to limit interference with filming.

Recreationists could be impacted through the interruption of their solitude and quiet by the noise from helicopter overflights while involved in hunting, hiking, camping or other high alpine activities. En route flights would pose the least amount of noise and visual impacts. Aircraft from the communities of Haines and Skagway flying over these areas are common. These flights involve commuter and flight seeing trips towards Glacier Bay National Park. The flights by the applicants would increase the number of helicopters potentially passing by. Because of the low and infrequent number of flights, short use season (approximately 60 days) and the very few numbers of recreationists, the additional impacts from overflights would be minimal.

More direct impacts may result from the take-off and landing activity. Hovering, engine start-up and shut-down results in increased duration of noise. Impacts would be low because of the short duration and low number of people, in most cases zero, near the landing and take-off areas. Some recreationists may also sense some visual disturbance from the presence of helicopters in high alpine areas.

3. Socio-Economic Impacts:
The Proposed Action expands the operation potential of the applicants and thus increases the economic role in the community tax base. A long term decline in wildlife resources could be a direct impact to recreational wildlife watchers and sport hunters as well as impact established guiding and outfitting operations. The hunting and wildlife viewing public, including commercial operators and individuals, are concerned over impacts on bear and mountain goat populations where heliskiing is occurring. The prospect of being displaced or being forced out of established long term businesses as a result of a diminished wildlife population is a concern.

B. Impacts of the No Action Alternative:

The No Action Alternative may reduce the potential positive socio-economic impacts in the form of a lower community tax base for Haines. The No Action Alternative would maintain the current economic diversity and tax base contributions by existing guides and outfitters, and ecotourism.

The No Action Alternative would reduce the risk of negative impacts to goat populations and to other wildlife species. Goats and other wildlife would continue to be impacted by current uses. If no landings are allowed on BLM administered land, that use will likely shift to State of Alaska land as there are no recreation permitting restrictions on state land. Because state land is adjacent to federal land and flight routes would be similar, overall impacts to wildlife may not change as much as it would initially seem.

Similarly, impacts to recreation users other than heliskiers would decrease with fewer flights. Noise would decrease and the opportunities for solitude would remain higher. However, like wildlife impacts, the change may not be as great as would seem likely because some use may shift to state land. There is also a potential loss of recreation opportunities for people desiring access to areas they feel are otherwise inaccessible to them by conventional means.

C. Cumulative Impacts:

In 1995, EA-AK-040-95-015 analyzed the impacts of helicopter glacier landings on several glaciers in the Skagway/Haines area. This use is for summer helicopter glacier tours and consists of landings on specified glaciers. Permits allow for a specific number of landings on named glaciers and specify helicopter access routes. Mitigation for this activity requires maintaining certain distances from wildlife, 1,500 feet, avoidance of recreation and inhabited areas and limited hours of operation. This use occurs from May to September.

Most of the heliskiing areas applied for are not the same locations as the summer operations utilize. However, a large number of landing areas determined acceptable in the 1995 EA have gone unused due to the applicants withdrawal of his application. The majority of these landings (3,100) are west of Haines, the same area that the heliskiing and filming applicants have requested.

The proposed heliskiing and filming use could amount to up to an additional 650 user days of winter recreation use. The potential number of landings would be 2,500 total (1,600 Out of Bounds Adventures, 600 Southeast Backcountry Adventures and 300 TGR). The cumulative period of exposure to helicopter supported recreation in areas where May through September and March and April

operations are proposed is approximately seven months. This is a concern as all the major critical life cycle phases for several wildlife species could be subjected to seven months of exposure.

In several select areas experiencing recreational helicopter exposure, wildlife populations are experiencing declines or changes in habitat use. Control areas are not experiencing as wide of variation in population changes. Data available are not sufficient to link the cause and effect of these variations.

The current policy of Alaska Department of Natural Resources is to allow unrestricted helicopter supported commercial recreation use. The impact of this use is similar to that described on public land, possibly greater, as no mitigation measures are required on state land. Restrictions of use on federal land may not decrease the total use but shift use from federal to state land. The applicants indicated they may conduct additional operations on state land with one helicopter even if permitted on federal land. If this use occurs at the same level as proposed on public land approximately 300 additional users days and 1,100 landings are possible. If no use occurred on federal land and all potential use occurred on state land, 950 user days and 3,600 landings are possible.

Private aircraft use, including helicopters, are also impacting the wildlife in the area. Some mining activity has utilized helicopters and likely impacted wildlife as described above for the duration of the exploration.

Cumulative noise impacts at landing areas are expected to be minimal if aircraft landing areas are located away from and outside recommended sensitive wildlife areas, rock island mountain goat habitats and other critical habitats.

D. Mitigation Measures:

If goats or goat activity, as evidenced by tracks, are observed at permitted sites during flights, on ski runs or at landing areas, the site should be avoided by a distance of one mile from the observed goat activity.

All flights, should operate within designated flight corridors and elevation restrictions. Heliskiing and filming areas depicted on the attached map may be authorized and likewise sensitive wildlife habitat and special flight restriction areas should not be authorized. Landing areas should also be outside areas prescribed sensitive habitat areas (see attached map). This will minimize the impacts described in the analysis by separating important habitat and animal wintering locations from helicopter recreation and filming use.

A 1,500 foot minimum elevation is recommended above the river bottoms for bald eagle courtship, nesting territory and a 5,000 foot elevation minimum for helicopter flight corridors to drop off sites that pass over mountain goat habitats.

The operation period should be from March 1st through April 30th in order to mitigate potential impacts to wildlife and protect use patterns for goats dispersing to kidding and high quality forage sites.

A range of sites should be designated as off limits to commercial heliskiing use to protect two monitoring control areas. These areas are used to compare helicopter use areas to areas without helicopter use and assist in the determination of term impacts to wildlife from helicopter use. It is recommended that the region encompassing the entire Chilkoot watershed above the upper end of Chilkoot Lake, Raymond Mountain area, the Mount Ashmun/Tohitkah Mountain area, and all drainages flowing into the Chilkat River from the east and south from the Alaska/Canadian Border south to Klutshah Mountain be designated a monitoring control area (see attached map). This area is all BLM administered land and it contains the core of the monitoring control area established when wildlife monitoring began in 1995. A second control area should be established on the west side of Lynn Canal in the general area from Sullivan Mountain to Haska Creek. This would reflect the coastal climate as compared to the more interior climate of the Chilkoot control area. The Sullivan Mountain/Haska Creek control area contains "mountain island" habitat and is adjacent to areas with high goat densities. Goat numbers in this area have decreased since monitoring began in 1995.

It is recommended that heliskiing runs that cross or originate on BLM administered lands and then terminate on state administered lands within important mountain goat winter range or sensitive wildlife habitat areas not be authorized.

Map Description

The attached map contains information important for the protection of goat in their wintering and spring habitats. Buffer zones (sensitive wildlife habitat areas and special flight restriction areas) of varying distances, depending on terrain and cover, have been placed around known goat habitat. Recommended use regarding when, where, how and how many flights are depicted on the attached map. Flight routes have been recommended to minimize impacts to all wildlife and potential recreational users. Flight routes are primarily closer to north facing slopes with altitude requirements that protect known occurrence of goats on these exposures. Goats will be attracted to southern slopes at this time of year, however it is not

uncommon to find groups of goats concentrated in localized habitats on all exposures. On these sites, they can take advantage of micro habitat features including cliffs, heavy timber over-story that intercepts the majority of snowfall, and rough terrain features that create micro complexes of southern exposures and forage under shallow or windblown snow sites. Runs requested in the Takhinsha Mountains (bordering Glacier Bay National Park) are north facing and contain the lowest populations of wintering goat populations.

Small areas of Takin Ridge has been designated as heliskiing operational areas. These are designed to provide escape opportunities and resting areas for any goats that may be in the area of heliski operations. Operations would be primarily limited to the north facing slopes in this area. Few goats are expected within these areas.

V. CONSULTATION AND COORDINATION

A. Persons and Agencies Consulted:

State of Alaska, Department of Natural Resources

Land Status

Planning Efforts

U.S. Forest Service, Juneau Ranger District,

Wildlife Consultation

Past and current NEPA documentation concerning glacier landing tours

Alaska Department of Fish and Game

Wildlife Consultation

City of Skagway

Socio-Economics

Tourism

Lynn Canal Conservation, Inc

Environmental Issues

Wildlife

Recreation Issues

Haines Service Area Board

Environmental Issues

Regulation/Mitigation

Haines Fish and Game Advisory Committee

Various guides and outfitters in the Haines area.

B. List of Preparers:

Jake Schlapfer, Outdoor Recreation Planner

Donna Redding, Cultural Resources

Jeff Denton, Subsistence/Wildlife

Dave Kelley, Natural Resource Specialist
Callie Webber, Realty Specialist

Appendix 1. Page References from EA-AK-040-95-015

5. The BLM will issue Special Recreation Permits in an equitable manner for specific recreational uses of the public lands and related waters as a means to control visitor use, to protect recreation resources, and to provide for private and commercial recreation use.

H. Other Laws and Permits

Neither the Forest Service nor the Bureau of Land Management have jurisdiction to regulate aircraft flight paths, altitudes, or noise caused by helicopter overflights. However, permit holders are required to abide by all federal, state, county (borough), or municipal laws, ordinances, or regulations which are applicable to the area or the operations covered by the permit. Failure to do so could result in either suspension or revocation of the permit.

H. 1. Federal Aviation Administration

The airports in Haines and Skagway are untowered facilities and are under the jurisdiction of the Federal Aviation Administration (FAA). The FAA is the agency responsible for all aircraft travel in uncontrolled airspace. The Flight Standards Division of the FAA is responsible for all flight operations (including safety) in controlled and uncontrolled airspace.

The Code of Federal Regulations for the Federal Aviation Administration and Department of Transportation Volume 14, Chapter 1, Part 135.203 states:

"Except when necessary for takeoff and landing, no person may operate Under visual flight rules (VFR) a helicopter over a congested area at an altitude less than 300 feet above the surface."

Only commercial helicopters have this 300-foot above-the-ground-level restriction. If a helicopter is not carrying passengers for compensation or hire, then they fall under the rules of Federal Aviation Regulation (FAR) 91.119 which states that helicopters may be operated at less than the minimums if the operation is conducted without hazard to persons or property on the surface.

In addition to the 300-foot rule, the NANA has also issued an Advisory Circular AC91.36C, dated March 19, 1982, that recommends flying 2,000 feet over noise sensitive areas.

The Alaska Department of Transportation owns, operates, and maintains the airstrips at both Skagway and Haines. They are not responsible for aircraft travel in uncontrolled airspace.

H. 2. City of Haines

The City of Haines currently does not have an ordinance in place that would specifically address the issue of noise caused by either helicopter or fixed-wing aircraft overflights. The city's nuisance ordinance, Chapter 8.12 NUISANCES, Sections 8.12.010 and 8.12.020 part E; and, Chapter 9.24, Section 9.24.050, part 3, (Healy, 1995) are provided as reference on this subject:

"8.12.010 Definitions. For the purpose of this chapter, "nuisance" means any act or creation which is injurious to the public health, or which prevents or abstracts the free and comfortable enjoyment of life and property or which is dangerous to surrounding property. (Ord. 409 §5 (part), 1987)

8.12.020 Certain conditions declared nuisances. It shall be unlawful for any person to cause or create the following nuisances:

E. To make any loud or unusual noise that annoys, injures or endangers the comfort, repose or health of a person, except as may be necessary in the operation of properly maintained pile drivers, power shovels, pneumatic hammers or other apparatus which could not be operated otherwise;

and,

9.24.050 Disturbing the peace. A. It is unlawful for a person to:

3. Between the hours of eleven p.m. and seven a.m. operate or use a pile driver, pneumatic hammer, bulldozer, road grader, loader, power shovel, derrick, backhoe, power saw, manual hammer, motorcycle, snow machine, or other machinery, instrument, appliance or vehicle which generates an unreasonably loud noise, after having been informed by another that such operation or use is disturbing or is likely to disturb the peace or privacy of others."

These ordinances have never been applied to aircraft in the Haines area.

H. 3. Borough of Haines

The Borough of Haines does not have a general noise ordinance which encompasses the entire borough. The Mud Bay and Lutak areas within the borough have planning and zoning regulations in place. These areas, referred to as Service Areas, have a noise ordinance dealing with heavy equipment operations and generators. The Service Area Boards would have to petition the Borough Assembly to enact ordinances which specifically addressed noise impacts from aircraft overflights (Palmer, 1995).

H. 4. City of Skagway

The City of Skagway has a general nuisance ordinance which is similar to that of the one listed for the City of Haines. They do not have any ordinances which specifically address noise issues relating to the operation of aircraft. The City Assembly would be the governing body responsible for enacting any ordinances which would regulate noise from aircraft take-offs, landings, and overflights (Filip, 1995).

H. 5. U.S. Fish & Wildlife Service

The U.S. Fish & Wildlife Service administers the Endangered Species Act, as re-authorized in 1982, and the Bald Eagle Protection Act of 1940, as amended. The Forest Service and BLM must consult with the U.S. Fish and Wildlife Service regarding any threatened or endangered species that might be impacted by the proposed action or any of the alternatives.

H. 6. Alaska Department of Fish & Game

The Alaska Department of Fish & Game (ADF&G) provides federal agencies with comments and recommendations on projects under the Fish and Wildlife Coordination Act (16 USC 661 *tense.*).

H. 7. Alaska Administrative Code

Section 5 AAC 92.080, in pertinent part states:

"Unlawful Methods of Taking Game; Exceptions. The following methods of taking game are prohibited:... (5) with the use of aircraft, snowmachine, motor driven boat, or other motorized vehicle for the purpose of driving, herding, or molesting;...."

This code section would be applicable to helicopter tours when they make close passes to wildlife for the purpose of viewing them.

Recreationists using the Chilkoot Trail in the Klondike Gold Rush National Historical Park, and in the vicinity of the trailhead area of the Chilkoot Trail would be impacted only slightly more by helicopter noise and presence under this alternative compared to Alternative C. From 1995 through 1999 there would be no landings authorized on the Norse Glacier under Alternative C; under Alternative D there would be 400 each year. Landings on the Norse Glacier will be allowed at the 1995 levels; with no annual increases through 1999. The average number of daily flights which would impact recreationists in these areas would range from approximately 22 per day in 1995 to 30 per day in 1999. Under Alternative C, the range would be 17 and 25 for 1995 and 1999, respectively. Again, these figures assume that 90 percent of the total number of tours conducted by Temsco would be associated with the Chilkoot Trail and Glacier Tour.

Landings authorized for Packer Expeditions under this alternative would not vary from either Alternative B - Proposed Action, or Alternative C - Eliminate Landing Locations; Day and Time Restrictions. Please refer to the discussion under Alternative B - Proposed Action for specific information concerning the impacts to recreationists.

E. Issue 3 - Noise Impacts to Wildlife

E. 1. General Discussion

The primary wildlife issue in this analysis is impacts to mountain goats. Other wildlife species are discussed first. Mountain goats are discussed in more detail after other species are addressed.

Black bear, brown bear and mountain goats use the pioneer vegetation at the foot of receding glaciers as foraging areas. Brown bear denning is not specifically identified in any area; however the habitat selected for den sites is abundant in the area of analysis. Late emerging bear (May and June), especially sows with cubs of the year, use the area around the den site for a period after emergence and seek security from male bears in the extreme high elevation rock pinnacle area. Wolves and wolverine are the predominant large predators in the region and mountain goats are a major prey species and carrion food source. Wolves den, raise young, have rendezvous sites, and occupy pack territories in the area. Local extinction, lowered populations, isolation of localized populations and gene pools and changes in productivity of mountain goats indirectly effect the functioning of a much larger ecosystem.

Bald eagles, various raptors, river otter, seals and sea lions (Lynn Canal), and a large variety of songbirds (neotropical, resident, neotemperate), nongame and game bird and mammals, and sea birds all occur and to varying degrees breed and raise young in the area. Specific information is insufficient to quantify these resources and relationships.

Mountain goat populations in Southeast Alaska are dispersed and low density. Subpopulations occupy relatively small patches of habitat. The small size and patchy distribution of groups creates a higher potential for in-breeding or periodic local extinctions (Smith & Raedeke, 1982). These dynamics of goat populations must be considered in assessing additional stresses to populations that may occur as a result of helicopter activity.

Mountain goat home ranges are relatively small. Studies of 28 radio-collared mountain goats in Southeastern Alaska show that year round home ranges are usually from 10 to 20 square kilometers (Fox, et al., 1989). Seasonal range attachment to sites is high. Preferred sites are used year after year. Attachment to sites used in summer is higher than winter (Fox, et al., 1989). Mountain goats prefer steep, rugged terrain (Brandborg, 1955; Rideout and Hoffman, 1975) and this preference is generally explained as predator avoidance (Fox and Streveler, 1986; Rideout and Hoffman, 1975).

Mountain goats spend 60 percent of daylight hours within or at the edge of escape terrain in summer (Fox, 1983; Schoern and Kirchoff, 1982; Smith, 1985). Mountain goats near Juneau use rock outcrops, alpine tundra, subalpine forest and shrub habitat types predominantly during summer (Schoen and Kirchoff, 1982). Assuming nighttime bedding in escape terrain, the longer period of daylight in summer means that mountain goats spend substantially more time outside escape terrain than in winter (Fox, et al., 1989). Smith (1985) reported that 95 percent of all relocations of radio-collared mountain goats in Southeast Alaska were within 1,300 feet of cliffs which could be used as escape terrain.

Biologists have not reached consensus regarding the effect of human disturbance on mountain goat distribution over long periods of time (Smith, 1986). Research has indicated that human activity can displace mountain goats from portions of otherwise undisturbed habitat. Chadwick (1973) found that in western Montana mountain goats abandon habitat temporarily as a result of road building activities. In Glacier National Park, Singer (1975) demonstrated some habituation to noise and human disturbance, however loud construction activities caused mountain goats to restrict their use of previously used area.

Foster and Rahe (1983) analyzed mountain goat response to hydroelectric exploration activities and found that a buffer zone of a two kilometer radius was required to prevent an overt response to human activity. A major concern for mountain goat management is increased human presence resulting in mountain goat disturbance, increased legal harvest and illegal harvest (Phelps, 1983; Quaedvlieg, et al., 1973).

The behavior of wildlife has been used to assess the influence of human activities (Hicks and Elder, 1979; Berger, et al., 1983; King and Workman, 1986). Because ungulates (hoofed mammals) devote a high percentage of time to feeding and foraging behavior, time budgets (documentation of the percentage of time spent in a variety of activities) are important parameters to evaluate disturbance. Long-term disturbances may lead to acute or chronic reduction in foraging efficiency (Berger, et al., 1983; King and Workman, 1986).

The percentage of time spent feeding does not seem to be different inside or outside of escape terrain (Fox, 1983); however, the forage intake rate is probably much greater in the dense vegetation outside escape terrain. The percentage of time mountain goats spend feeding or searching for food increases with distance from escape terrain (McFetridge, 1977) probably because feeding is the only incentive for being away from the escape terrain. The relative amount of feeding time may decrease slightly with distance because of an increase of time devoted to keeping alert to the presence of predators (Risenhoover, 1981).

Stockwell et al. (1991) conducted time budget studies of bighorn sheep at Grand Canyon National Park where helicopter traffic ranges from 15,000 to 42,000 flights per year. This study and others (Altman, 1958; Berger, et al., 1983; Drausman and Hervert, 1983; Knight and Knight, 1984; Miller and Smith, 1985; and Krausmann, et al., 1986) indicated that the degree of disturbance was a function of the proximity of the aircraft. Heart rates of Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*) did not change in response to high flying aircraft (over 400 meters) but sheep did respond to low flying aircraft (90 to 250 meters) by running, which increased heart rates by three to five times (MacArthur, et al., 1979, 1982). Helicopters at low altitude caused a notable reduction in foraging efficiency in the Grand Canyon study (Stockwell, et al., 1991).

Another study (Bleich, et al., 1994) warned scientists to be concerned about the effects of helicopter activity on the condition and reproductive success of large mammals. Nutritionally stressed individuals may be especially susceptible to disturbance from helicopter activity which causes them to depart from prime habitats for extended periods. Data presented by Krausmann and Hervert (1983) also support this. The effects of such disturbance would be exacerbated for mountain goats living in environments where critical resources are limited and widely distributed (Bleich, et al., 1994). Mountain goat movements resulting from disturbance also have the potential to make them vulnerable to predation.

Management recommendations resulting from the Stockwell, et al. (1991) study include minimizing impacts by restricting the number of flights and by regulating the flight altitudes of helicopters. Flight altitudes of at least 400 to 500 meters were recommended to minimize impacts. Fox, et al. (1989) recommended that helicopter activity near cliff areas used by female goats for kidding and early neo-natal periods be avoided. These studies provide the basis for the proposed mitigation of all the action alternatives.

The area of analysis for wildlife resources on National Forest System lands includes the Meade Glacier, Schube Glacier, Denver Glacier, East Fork Glacier and the unnamed glacier east of Laughton Glacier. In addition, the Glacier Station Landing site near the Laughton Glacier Trailhead is on National Forest System lands. Maps 3-R through 3-AA show landing sites and flight paths associated with each landing site. Specific landing sites are discussed as a separate section because wildlife use and habitats are unique in each area. Wildlife concerns focus primarily on mountain goats, but other species are briefly discussed.

E. 3. c. Denver Glacier

There are four separate landing sites on the Denver Glacier. The most northerly and westerly of these four are situated in areas at least 0.5 to 1.0 miles away from the nearest predicted mountain goat habitat (Maps 3-R through 3-AA). ADF&G mountain goat surveys show that few mountain goats have been sighted in this general area. The two most southerly landing sites on the Denver Glacier are within predicted mountain goat habitat. The flight paths to the two most southerly sites on the Denver Glacier cross over predicted mountain goat habitat. ADF&G surveys recorded few mountain goat sightings for this general area, however, fewer surveys have been conducted in this area.

E. 3. d. Schubee Glacier

The three separate landing sites on the Schubee Glacier are 0.5 to 1.0 miles away from the nearest predicted mountain goat habitat (Maps 3-R through 3-AA). ADF&G mountain goat surveys have recorded mountain goats on south facing slopes approximately 1 mile south and west of the landing sites (9 adults and 2 kids in the 1983 survey). The distance of these landing sites from known mountain goat habitat should protect higher quality mountain goat habitat from adverse impacts. The flight paths to the Schubee Glacier landing sites do not cross predicted mountain goat habitat.

E. 3. d. Meade Glacier

There are a total of seven landing sights on the Meade Glacier, Temsco has requested two and L.A.B. has requested five. This is the only glacier on which both Temsco and L.A.B. have requested landing sites. L.A.B.'s landing tours on the Meade would originate from the Haines airport. There is not a separate discussion for L.A.B.'s landings on the Meade under the section which addresses landings which originate from Haines (vs originating from Skagway). The Habitat Capability Model output predicts very scattered mountain goat habitat along the flight path to the Meade Glacier and in the area of the landing sites identified by both Temsco and L.A.B. (Maps 3-R through 3-AA). These scattered habitats are generally at least 0.5 to 1 mile away from flight paths and landing sites. ADF&G has conducted fewer mountain goat surveys in this area. In general, it appears that fewer mountain goats have been sighted along the transects that have been run.

E. 4. Glacier Landing Sites Discussion -- BLM Lands

E. 4. a. West Creek Glacier

Earlier discussions on bear, wolf, wolverine, bald eagles, various raptors, river otter, seal and sea lions (Lynn Canal), and a variety of songbird, nongame and game birds and mammals, and sea birds apply to all landing sites.

This landing site is on the foot of an unnamed glacier called West Creek Glacier for the purposes of this analysis. The setting is a glacial valley approximately 0.5 miles wide near the bottom of the steep side slopes (See Maps 3-A through 3-Q). The site is less than 100 yards from the end of the glacier and pioneering vegetation associated with receding alpine glaciers. Site specific observation data regarding mammals or relative to mountain goat kidding, seasonal, or breeding habitat use and distribution is lacking. Goat habitat capability criteria application indicates mountain goat cliff habitats within 0.6 miles of the landing site and potential summer foraging sites within 0.25 miles. This habitat would be typical summer habitat with the presence of year-long habitats characterized by timber and cover associated cliffs being within 1 mile east of the site. Black bear, brown bear and mountain goats use the pioneer vegetation at the foot of the receding glaciers as foraging areas. Brown bear denning is not specifically identified in the Norse Glacier valley or side slopes; however the habitat selected for den sites is abundant in the area.

Flight routes to and from the landing sites from the north and west traverse primarily ice fields and high elevation bare rock terrain. The proposed approach flight path from the southeast up West Creek valley flies over portions of mountain goat, bear and moose habitat as well as the wildlife communities typical of the forested and alpine tundra types in this region.

E. 4. b. Ferebee Glacier

The proposed landing site is near the foot of the Ferebee Glacier in a valley bottom approximately 1.0 miles wide (See Maps 3-A through 3-Q). The lower limits of predicted mountain goat habitat and timber/cliff cover occur within 0.5 miles of the landing site. These habitats are isolated in terms of timber cover and exhibit abundant cliffs both in the timber and in alpine tundra areas within a mile of the landing site. The upper limits of mountain goat habitat in the Ferebee River drainage would best describe the area surrounding the landing site. Flight approaches from the north traverse the ice field until within 2 miles of the landing site when mountain goat habitat on the east exposure of the valley would be flown over for a distance of 1.5 miles. Flight routes proceeding to the east cross over portions of mountain goat summer habitat on the south and west facing basins on the Ferebee side of Halutu Ridge and over slopes occupied by mountain goats in the Burro Criid drainage.

E. 4. c. Norse Glacier

The landing site lies at the very end of the receding Norse Glacier. The site is at the junction of a small drainage flowing from a steep timbered canyon to the north and another drainage from the northeast while the Norse Glacier flows in a west southwesterly direction and becomes the Norse River valley as the valley continues to the southeast. The landing site is within 0.2 miles of mountain goat timber/cliff cover on south facing slopes with a flight line following routes immediately paralleling the same south facing cliff terrain to the west and southeast along both sides of the Norse River Valley. The landing site is within 100 yards of foraging sites for mountain goats and bears. The flight line proposed due north of the landing site also is within 0.2 miles of mountain goat timber/cliff cover habitats. Mountain goat habitat is very limited in the area, with south exposure cliff/timber, and cliff/alpine tundra spring greenup, parturition, and habitats of yearlong significance to goats all occurring either within a 1 mile radius of the landing site or immediately below or adjacent to approach or take-off aircraft flight paths (See Maps 3-A through 3-Q).

All typical large mammal species occurring in these types of habitats have been observed. Harvest or harvest effort in this area has expanded in this area over the last decade. Refer to the discussion for other large mammals and other species in the West Creek Glacier text.

E. 4. d. Grand Canyon Glacier

This landing site is well out of mountain goat habitat capability. Approaches or exit routes from the landing site are primarily over high rock outcrop and ice fields with no habitat capability. Only the portion of flight routes accessing the landing site that occur in the Norse River and Taiya River Valley occur over or adjacent to large mammal habitats and habitats of typical wildlife species groupings typical of the region (moose, black and brown bear, mountain goat, wolf, wolverine, coyote, raptors, various furbearers and non game birds and mammals). All large mammal species have been observed and harvested on the habitats noted in the river valleys and associated mountain slopes. See discussion of large mammal and other species in the West Creek Glacier text (See Maps 3-A through 3-Q).

E. 4. e. Chilkat Glacier

This landing site is within 200 feet of the south slopes of a 4.2 square mile island of potential mountain goat habitat surrounded completely by large extensive ice fields (See Maps 3-A through 3-0). No specific wildlife data is available for the site or immediate area or the flight routes accessing this landing site.

E. 4. f. Bertha Glacier

The proposed landing site is near the head of the Bertha Glacier and east, south, and southwest of the site is continuous ice field and bare rock outcrop. To the northwest, approximately 0.6 miles of the site, is the base of mountain goat habitat that would be the upper limits of mountain goat habitat in the valley containing the Bertha Glacier (See Maps 3-A through 3-Q). Proposed access routes to the site however traverse a portion of the Tahkin River Valley, McKlellon Flats, and the entire length and is flanked on both sides by mountain goat habitat with documentation in general terms that mountain goats do use the habitats and harvest effort and success has occurred in this valley. Known moose and bear occurrence and harvest is documented for the lower end of the Bertha Glacier Valley and Tahkin River bottom. McKlellon Flats and Tahkin River Valley areas are owned by the State of Alaska and these areas are potentially slated for road access construction and timber harvest activities.