

Environmental Assessment
For
Commercially Guided Helicopter Skiing
In the Allen Glacier to Cleave Creek Area
Of the Cordova Ranger District
Chugach National Forest



Table of Contents

Page

Analysis Area Map..... iii

Chapter 1..... 1

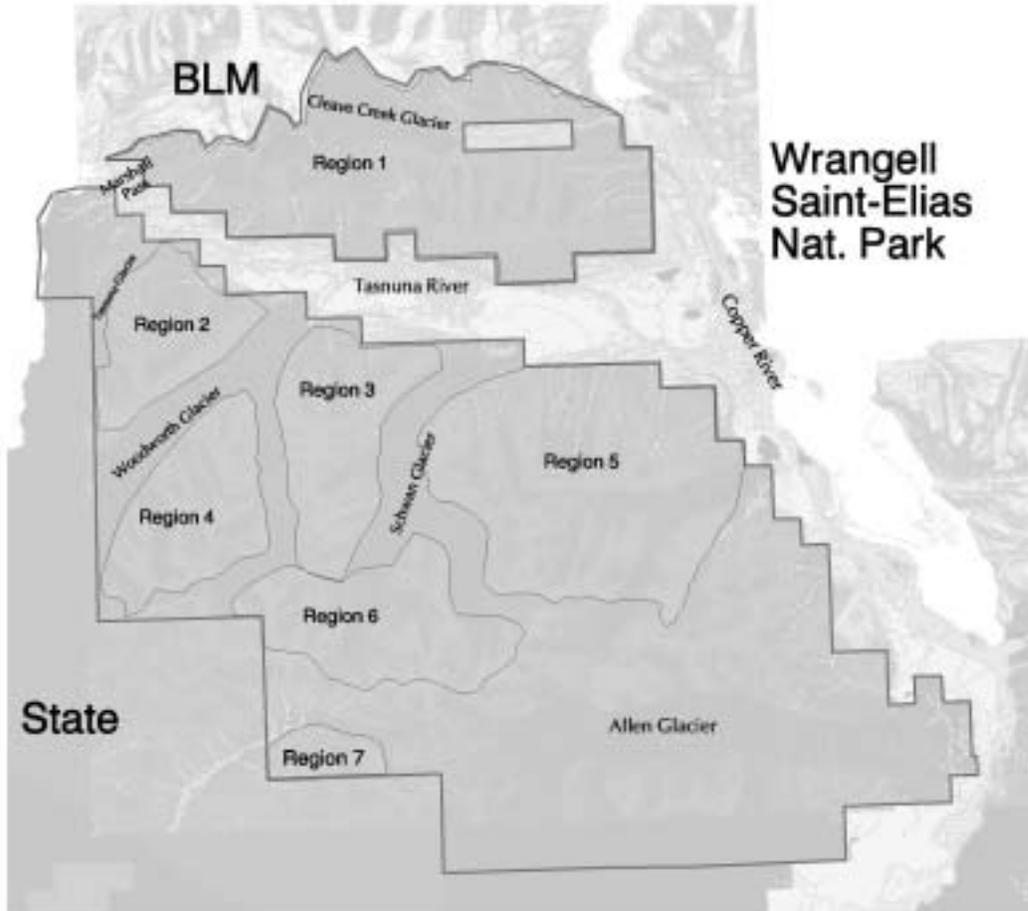
Introduction.....1
Project Area..... 1
Purpose and Need..... 1
Proposed Action..... 2
Decision to be Made.....2
Forest Plan Management Direction.....2
Table 1.1.....4
Public Involvement..... 8
Issues..... 9
Applicable Laws and Executive Orders.....10
Planning Record.....11

Chapter 2..... 12

Introduction.....12
Alternative Development Process.....12
Recreation Carrying Capacity Process.....12
Table 2.1.....13
Table 2.2.....15
Alternatives Considered but Eliminated from Detailed Study..... 16
Items Common to all Alternatives 16
Winter Mountain Goat Habitat Map.....18
Alternatives Considered in Detail.....19
Alternative 1, 2 3, & 4(one, two, three or more operators)..... 19
Mitigation Measures Common to all Alternatives..... 20
Mitigation for Noise and Recreation Experience.....20
Mitigation for Goats and Wildlife..... 21
Monitoring..... 21
Comparison of Alternatives by Issue..... 23
Issue 1 (Noise and Recreation experience).....23
Issue 2 (Impact to wildlife).....31
Issue 3 (Affect on other Landowners and Agency lands).....32
Issue 4 (Safety).....32

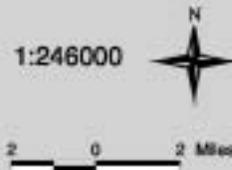
Chapter 3.....	35
Introduction.....	35
Analyzing Effects.....	35
Direct, Indirect and Cumulative Effects.....	35
Unavoidable Adverse Effects.....	35
Short Term Use and Long Term Productivity.....	36
Irreversible and Irretrievable Commitments.....	36
Environmental Effects of the Significant Issues.....	36
Issue 1 (Noise and Recreation Experience).....	36
Table 3.1.....	37
Cumulative Effects	40
Issue 2 (Impact to wildlife).....	42
Effects of Helicopters and Heli-skiing on Wildlife.....	42
Potential Impacts to Focus Wildlife Species.....	44
Other Bird Species.....	46
Table 3.2.....	46
Mountain Goats.....	47
The Effects of the Alternatives on Mountain Goat.....	50
Summary of Direct and Indirect Effects on Wildlife.....	51
Cumulative Effects.....	51
Sensitive Species.....	53
Table 3.3.....	53
Issue 3 (Affect on other Landowners and Agency lands).....	54
Issue 4 (Safety).....	55
Other Environmental Considerations.....	57
Air Quality.....	57
Table 3.4.....	58
Facilities.....	58
Heritage Resources.....	58
Land Status.....	58
Minerals.....	58
Plans of Other Agencies.....	58
Consistency with CFR 241.22 and ANILCA 501(b).....	58
Findings and Disclosures.....	60
Appendix I. - Agencies and Persons Consulted.....	62
Appendix II. - Biological Evaluation of the Analysis Area.....	63
Appendix III. - Literature Cited.....	71
Appendix IV - Summary; Comments Received From Public Involvement & Scoping	74

Guided Heli-ski Analysis Area Cordova Ranger District Chugach National Forest



Legend

- Heli Regions
- Permit boundary
- Streams
- National Forest Lands
- Native Lands
- Municipal, Private, & Other
- State Lands
- Water



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 last updated on 10/17/02

Chapter 1- Purpose and Need

Introduction – The Forest Service has prepared this Environmental Assessment (EA) on the potential effects of issuing a special use permit for guided helicopter skiing (heli-skiing) on the Cordova Ranger District of the Chugach National Forest in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This EA incorporates documented analysis by summarization and reference where appropriate.

Analysis Area – The analysis area under consideration for permitting commercial heli-skiing is located in the mountainous areas between Marshall Pass and the Copper River, bounded on the south by Allen Glacier and on the north by the BLM/Forest boundary on the north side of Cleave Creek. The area encompasses approximately 225,000 acres on National Forest System lands. Private lands in the drainage would not be authorized for use with this permit. Most private land is located in the valley bottoms along the Copper River, Tasnuna River, and Cleave Creek. The area is located in the Cordova D-4 and D-3 quadrangles and Valdez A-4 and A-3 quadrangles. (See Analysis Area Map, Page iii).

Purpose and Need - The proposal is in response to a request made on February 15, 2001 by Valdez Heli-Ski Guides (VHSG) for a re-issuance of the permit to provide guided heli-skiing in this area.

National Forest System lands in the Chugach Mountain Range provide many winter recreational opportunities including snowmobiling, cross-country skiing, ski touring, fixed-winged supported skiing, and helicopter supported skiing. Heli-ski operators seek opportunities for untracked powder snow, several vertical runs per day, and a backcountry experience. Many areas on the Chugach Range have excellent physical characteristics (terrain and snow conditions) for helicopter skiing. Currently, guided heli-skiing is authorized on both State and BLM lands in the adjacent Thompson Pass area. The demand for this type of activity prompted the applicants to approach the Forest Service for authorizations to provide this service on National Forest System lands in order to better provide the type of recreational experience their guests were pursuing. Additionally, spreading out the use would improve safety of heli-ski operations by reducing the number of skiers concentrated in one area.

The current permit holder operating out of Valdez uses a staging area at the Tsaina Lodge at milepost 35 of the Richardson Highway at Thompson Pass. Other Valdez operators either fly directly from Valdez or have other staging areas from the Richardson Highway. Another operator has a staging area at the Orca Adventure Lodge about 2 miles north of Cordova. The proposed permit area is not near any major population center and getting to the area does not require flying over Valdez or Cordova.

This proposal helps meet the public demand for quality safe, guided helicopter skiing in a remote, pristine setting. Guided helicopter skiing also helps meet the Chugach Forest Plan's management goals and desired conditions for 1) Maintaining quality settings for motorized recreation opportunities; 2) Providing predominant conditions which result from natural processes; and 3) undeveloped dispersed recreation predominant over most of the Forest. A mix of motorized and non-motorized opportunities is prescribed by the Forest Plan (primarily non-motorized in the summer and motorized in the winter). This will be the only location that guided helicopter skiing would be authorized on the Cordova Ranger District of the Chugach National Forest during the 2003 season. At this time there are no known commercial operators other than heli-ski operators

interested in the area, but it is expected that in time other commercial operations such as dogsledding, snowshoeing, ski-touring or snowmobiling may become viable options within the analysis area.

Proposed Action - Authorization of two 1-year special use permits for guided helicopter skiing on National Forest System lands within the analysis area is proposed. A prospectus would be used to select the successful applicants and one-year probationary permits would be issued. Following the probationary periods, subsequent permits of up to five years may be issued contingent upon successful operations and acceptable performance by the permit holders. Guided helicopter skiing would be permitted in seven regions totaling 225,280 acres. This represents approximately 10% of the districts 2,300,000 acres. The season of use would be from February 1st through April 30th annually (89 days) and may be extended, upon request, if conditions warrant. Based on the recreation carrying capacity for the area, a maximum of eight helicopters and 87 persons at one time (PAOTs) would be allowed during the 89 days.

Decision to be Made - Based on this environmental analysis the Cordova District Ranger will decide whether or not to issue one or more temporary one-year special use permits for guided helicopter skiing in the project area. A prospectus would be used to determine who receives the permit(s). Contingent upon successful operations and acceptable performance by the permit holder(s), subsequent permits of up to five-year durations may be issued without another prospectus. The decision would include maximum limit of client days, period of use, potential number of permits, mitigation measures and monitoring requirements

Forest Plan Management Direction- The Revised Forest Plan Record of Decision (ROD) was signed May 31, 2002. This document provides the overall long-term management direction for the Forest, and is the decision document for the integrated, long-term resource planning on the Forest. It establishes goals, management direction, and standards and guidelines to follow in implementing the goals.

The Revised Forest Plan divides the Forest into Management Area. Each Management Area was assigned a prescription that includes specific direction on the management of Forest System lands. Each management area prescription includes the following:

Theme: A short description of a management scenario or philosophy.

Management Intent: A summary of the desired conditions for social and ecological systems.

Activities Tables: A tabular display of typical activities that may or may not be allowed in a given prescription:

Standards and Guidelines: Specific management direction for a conditionally allowed management activity.

Prescription Categories - The management area prescriptions are grouped into five categories to represent similar ecological processes, levels of development, or human influence. They range from little human influence (Category 1) to long-term human influence (Category 5).

The Heli-Ski area is located within a 501(b)-2 Management Area prescription, with a prescription category 2. A 501(b)-2 Management Area Prescription has the following characteristics:

Theme: 501(b)-2 Management Areas emphasize the conservation of fish and wildlife and their habitats while providing opportunities for backcountry recreational activities in a natural appearing landscape. This management area prescription was developed to address the “Management of Fish and Wildlife Habitat”, “Motorized Access”, “Non-motorized Access”, and “Recreation Opportunities” interests.

Management Intent:

Ecological Systems desired condition: Ecological processes, relatively unaffected by human activity, dominate 501(b)-2 Management Areas. Vegetation in the area will be mostly late successional unless regenerated by resource projects or natural processes such as fire, insect and disease. Emphasis will be on the conservation of habitats for fish and wildlife. Projects to restore or enhance fish and wildlife habitat may be allowed if consistent with the conservation of fish and wildlife and their habitats.

Social Systems desired condition: 501(b)-2 scenery will be natural in appearance. Management Areas will provide opportunities for solitude, isolation, and quiet when traveling cross-country. The Recreation Opportunity Spectrum will range from Primitive to Semi-primitive Motorized. There will be evidence of human use such as trails, hardened campsites, and historic structures. No new roads will be constructed. Reasonable access, including roads for conducting mineral operations shall be approved under a mining plan of operations. Developments and larger groups should be localized in recreation concentration areas, minimizing effects on the overall management area may be implemented to avoid resource damage, wildlife conflicts or safety issues.”

Activities Allowed: The following is a summary of activities allowed, conditionally allowed, or not allowed in a 501(b)-2 Management Area:

Table 1.1 – Management Area Activities

501(b) - 2 Management Area - Activities Table			
Physical Elements			
Soil/Watershed Projects	Y		
Biological Elements			
Vegetation Management	Y	Integrated Pest Management	Y
Wildlife Habitat Projects	Y	Management Ignited Prescribed Fire	Y
Fish Habitat Projects	Y		
Resource Production			
Forest Products		Minerals/ Mining	
Commercial Timber Harvest ASQ	N	Mineral Activities - Localable	C
Commercial Timber Harvest - nonchargeable	N	Mineral Activities - Salable	C
Commercial Special Forest Products	Y		
Personal Use Timber Harvest	Y		
Personal Use Special Forest Products	Y		
Use and Occupancy Activities			
Recreation/Tourism Activities			
Recreational Gold Panning	Y	Forest Service Recreational Cabins	Y
Maximum ROS Class ¹	SPM	Campgrounds	Y
Nonmotorized Recreation Use - Summer	Y	Minimum SIO ²	M
Nonmotorized Recreation Use - Winter	Y	Hardened Dispersed Camping Sites	Y
Day-use Facilities	Y	Viewing Sites	Y
Transportation/Access			
Marine Transfer Facilities	N	New Roads Built by Others	C
Boat Docks and Ramps	Y	New Trails	Y
Mode Changes: Parking Lots at Trailheads, Ferry Terminals, etc.	Y	Administrative and Permitted Motorized Access	C
New FS Built Roads	N		
Lands/Special Uses			
Electronic Sites	Y	SUP Recreation Equipment Storage/Cache	Y
Utility Systems	N	Outfitter/Guide Capacity Allocation (%)	50%
SUP Destination Lodges	N	Administrative Facilities	C
SUP "Hut-to-Hut" Type Recreation Cabins	Y		
<small>Y - the activity is allowed consistent with the management intent C - the activity is allowed consistent with the management intent, standards and guidelines N - the activity is not allowed in the management area NA - not applicable ¹ ROS (Recreation Opportunity Spectrum) classes: P - Primitive I and II; SPNM - Semi-primitive Nonmotorized; SPG - Semi-primitive Groups; SPM - Semi-primitive Motorized; RN - Roaded Natural; RM - Roaded Modified; R - Rural ² SIO (Scentic Integrity Objective) classes: VH - Very High; H - High; M - Moderate; L - Low; VL - Very Low</small>			

The Revised Forest Plan also made the decision regarding motorized use on National Forest System lands. The proposed action is consistent with the Forest Plan. The analysis area falls into the category of “**Open To All Motorized Uses**” in the winter (December 1 through April 30). The direction states: “These areas are designed to allow a full spectrum of opportunities for winter motorized recreation. Both snow machines and helicopters are permitted in these areas during the winter season. Site-specific or other closures may be implemented to avoid resource damage, wildlife conflicts or safety issues.”

During the summer season (May 1 through November 30), the analysis area falls into the category of “**Open To Helicopters, Closed To OHVs**”. The direction for this category states: “These areas are managed to provide an opportunity for helicopter supported hiking. They are open to helicopter access during the summer months, but closed to OHV use and airboats (outside of established water channels or water bodies). However, the use of OHVs or airboats for subsistence purposes by rural Alaska residents is allowed in these areas. Motorized dredges for recreational gold panning are allowed. Site-specific or other closures

Standards and Guidelines:

Access and Transportation: Reasonable access, as defined by ANILCA, Sec. 1323(a), will be allowed to private lands.

Mountain Goat Habitat Management and Raptor Nest Protection: The revised plan also provides guidelines for mountain goat habitat management and raptor nest protection management (reference pages 3-29 and 3-30 of the Revised Forest Plan). Those guidelines include:

1. Locate concentrated human activities away from important wintering, lambing, and kidding habitat. A minimum one-mile avoidance distance is recommended but could vary depending on site-specific circumstances as long as these habitats are adequately protected.
2. Forest Service permitted or approved activities such as, but not limited to, aircraft flights (fixed-wing and helicopter), heli-skiing, or heli-hiking should maintain a minimum landing distance of ½ mile from all observed mountain goats or Dall sheep. While flying, aircraft will maintain a 1,500-foot vertical or horizontal distance from all observed mountain goats or Dall sheep. Pilots will use flight paths that avoid mountain goats and their habitat as much as possible. Such flight paths will generally avoid ridge tops.
3. Minimize disturbance within 330 feet of active Bald Eagle and Osprey nesting sites, and within 660 feet of goshawk nests. (Generally March 1 to August 31). (Summarized)

Roadless Areas:

Management of roadless land on the Chugach National Forest is a significant concern with the public as expressed by issues on sustaining ecosystems, protecting fish and wildlife habitat, designating undeveloped areas for motorized and non-motorized recreation, maintaining natural quiet areas and protecting scenic quality.

An updated roadless inventory divided the Forest into 16 roadless areas totaling 5,434,710 acres. This is about 99 percent of the Forest's total acres. The heli-ski area described in this environmental assessment is located within the Tasnuna River Inventoried Roadless Area. This roadless area includes 438,890 gross acres and 349,540 National Forest System acres.

It is the intent of the Chugach National Forest to manage roadless lands as described in the Revised Land and Resources Management Plan and according to the new Roadless Area Conservation Rule. Under the new Roadless Area Conservation Rule, road construction activities are prohibited in inventoried roadless areas. While there is still a lot of uncertainty in the implementation of the Rule, the Chugach National Forest will manage all inventoried roadless lands under the Final Rule. Under all alternatives described in this EA, no new road construction is proposed or necessary to implement any of the alternatives. Because the proposed activities occur during the winter, under snow-covered conditions, the roadless area characteristics of this area would be unaffected.

Recreation Opportunity Spectrum (ROS):

The Recreational Opportunity Spectrum describes the range of prescriptions or ROS classes and recreational settings an area may be managed for. ROS ranges vary from "Rural" to "Primitive" as shown in Table 1.2. The Tasnuna River and the surrounding heli-ski analysis area is located within a PII, Primitive II ROS Class as identified in the Forest Plan and described below.

Primitive II ROS characteristics include: (see Table 1.2 on the following page)

- Access: Motorized uses are allowed. (Note: Winter motorized uses are allowed; summer motorized uses are allowed only for helicopter or fixed-wing access as possible).
- Remoteness: None or very infrequent sounds of human activity.
- On-site Recreation Development: Recreation structures are rarely present.
- Social Encounters: Very low interaction between users.
- Visitor Impacts: Human use essentially unnoticeable.
- Visual: Alterations to landscape are not evident. Few structures present.

Table 1.2 Recreation Opportunity Spectrum Class Characteristics

Table 3-8: Recreation opportunity spectrum class characteristics.

ROS Class	Solitude		Social			Maximum Party Size ²	Degree of Risk and Challenge
	On Trails / On Shorelines	Off Trails / On Shorelines	Level of Encounters ¹				
			On Trails	On Shorelines	Off Trails / Off Shorelines		
Primitive	High	Very High	Low < 5 parties/day. No other parties within sight or sound of campsites or cabins.	Low < 3 parties/day. No other parties within sight or sound of campsites or cabins.	Very Low < 1 party/day. No other parties within sight or sound of campsites or cabins.	15	Very High
Semi-primitive Nonmotorized	High to Moderate	Very High	Moderate < 15 parties/day. No more than 3 other parties within sight or sound of campsites or cabins 85% of the primary use season.	Low < 4 parties/day. No other parties within sight or sound of campsites or cabins 85% of the primary use season.	Low < 4 parties/day. No other parties within sight or sound of campsites or cabins.	15 in Rx 123 and 131, 24 in all other Rx's	High to Moderate
Primitive II	High	High	Low < 5 parties/day. No other parties within sight or sound of campsites or cabins.	Low < 3 parties/day. No other parties within sight or sound of campsites or cabins.	Very Low < 1 party/day. No other parties within sight or sound of campsites or cabins.	15	Very High
Semi-primitive Groups	High	High	Moderate < 15 parties/day. No more than 3 other parties within sight or sound of campsites or cabins 85% of the primary use season.	Low < 4 parties/day. No other parties within sight or sound of campsites or cabins 85% of the primary use season.	Low < 4 parties/day. No other parties within sight or sound of campsites or cabins.	100	Moderate to Low
Semi-primitive Motorized	Moderate	High	Moderate < 15 parties/day. No more than 3 other parties within sight or sound of campsites or cabins 85% of the primary use season.	Low < 4 parties/day. No other parties within sight or sound of campsites or cabins 85% of the primary use season.	Low < 4 parties/day. No other parties within sight or sound of campsites or cabins.	50	High to Moderate
Roaded Natural	Moderate to Low	Moderate to Low	High > 15 parties/day. Six or more other parties may be within sight or sound of campsites or cabins.	Moderate < 15 parties/day. Six or more other parties may be within sight or sound of campsites or cabins.	Low < 4 parties/day. No other parties within sight or sound of campsites or cabins 85% of the primary use season.	NA	Moderate to Low
Roaded Modified	Low	Moderate to Low	High > 15 parties/day. Six or more other parties may be within sight or sound of campsites or cabins.	Moderate < 15 parties/day. Six or more other parties may be within sight or sound of campsites or cabins.	Low < 4 parties/day. No other parties within sight or sound of campsites or cabins 85% of the primary use season.	NA	Moderate to Low
Rural	Very Low	Low	NA	NA	NA	NA	Very Low
Urban	Very Low	Very Low	NA	NA	NA	NA	Very Low

¹ Level of Encounters may be exceeded for up to 15% of the primary use season (approximately 1 day/week average). Applies to Category 2, 3, 4, and 5 prescriptions only.
² Group Size may be exceeded for up to 15% of the primary use season (approximately 1 day/week average). Applies to Category 2, 3, 4, and 5 prescriptions only.

Table 3-8 (continued): Recreation opportunity spectrum class characteristics.

ROS Class	Access ¹		Managerial			Management Class ²
	Surface Access	Air/Water Access	Facilities and On-Site Controls			
			On-Site Development	Development Scale ³	On-Site Controls	
Primitive	Nonmotorized, primitive trails, foot	kayaks, canoes, motorboats, aircraft	None except for recreation cabins	1	None	Infrequent, minimal only to maintain route
Semi-primitive Nonmotorized	Nonmotorized, primitive trails, foot	kayaks, canoes, motorboats, aircraft	Recreation cabins, primitive campgrounds, no synthetic materials	2	Few, native materials only	Annual to bi-annual to maintain route and trail
Primitive II	Primitive trails, snowmachines for traditional activities in CRAs	kayaks, canoes, motorboats, aircraft	None except for recreation cabins	1	None	Infrequent, minimal only to maintain route
Semi-primitive Groups	Nonmotorized, developed trails	kayaks, canoes, motorboats, aircraft	Recreation cabins, improved trails, rustic style day-use facilities and edges	2	Obvious at areas of high use, minimal elsewhere, rustic style	Annual or as needed to maintain route, trail and minimize resource impacts
Semi-primitive Motorized	Motorized, snowmachines, OHVs, developed trails, foot	kayaks, canoes, motorboats, aircraft	Recreation cabins, primitive campgrounds, no synthetic materials	2	Few, native materials only	Annual to bi-annual to maintain route and trail
Roaded Natural	Snowmachines, OHVs, developed trails, foot, bicycles, roads	kayaks, canoes, motorboats, aircraft	Recreation cabins, improved trails, rustic style day-use facilities and edges	3	Obvious rustic style, combined parking areas, trails	Annual or as needed to maintain route and trail and minimize resource impacts
Roaded Modified	Motorized, snowmachines, OHVs, developed trails, foot, bicycles, roads	kayaks, canoes, motorboats, aircraft	Recreation cabins, improved trails, rustic style day-use facilities and edges	3	Obvious rustic style, combined parking areas, trails, directional signage	Annual or as needed to maintain route and trail and minimize resource impacts
Rural	All types	All types	Facilities for user comfort and convenience	4	obvious barriers, parking areas, pedestrian controls	As needed to insure public safety
Urban	All types	All types	Facilities for user comfort and convenience	5	extensive on-site controls	As needed to insure public safety

¹ See Water and Stream Motorized Recreation Access Maps for information on recreational access.
² From FSM 2530
³ From Meaningful Measures

Desired Condition Of The Analysis Area:

The desired conditions will help guide management of the project consistent with the Revised Forest Plan, the significant issues and the ecological conditions of the analysis area. The desired condition for the analysis area is to provide seasonal opportunities for motorized recreation activities in a safe manner and meet the recreation experience guidelines for the Recreation Opportunity Spectrum (ROS) Class of Primitive II prescribed for the area. The ROS class of Primitive II establishes the maximum number of people per party at 15 and the number of encounters per day between parties at one or less and allows for motorized access. It also establishes the recreation carrying capacity that will be used to determine the number of client-days to be authorized in the permits. Refer to Chapter 2 to see how alternatives were developed using the recreation carrying capacity analysis. It is also desired that the effects of any permitted activities on wildlife be minimized or mitigated.

Consistency with Revised Forest Plan Direction:

Permitting commercially guided heli-skiing in the analysis area as proposed is consistent with the Revised Forest Plan, including the theme, management intent, and standards and guidelines for the area. The alternatives described are consistent with the ANILCA 501(b)-2 Management Area Prescription, Roadless Area management direction, and Recreation Opportunity Spectrum (ROS) Prescription of Primitive II.

For additional information on the 501(b)-2 management prescription, see section 4-37 of the Revised Forest Plan.

Public Involvement – The public has been invited to participate in the project in several ways. Public involvement was initiated in April 2001, with the *Chugach National Forest Schedule of Proposed Actions for Environmental Analysis*. Approximately 344 quarterly schedules were mailed to interested individuals, organizations, and agencies. A total of 30 written responses were received as a result of this scoping effort (see Appendix III).

In June 2001, a letter providing information about the proposal and seeking public comment was mailed to approximately 5 companies that had expressed interest in providing heli-ski guided operations on the Cordova District of the Chugach National Forest. One objective of this letter was to gather information on potential demand for providing this service. In July of 2001, letters were sent to adjacent landowners including State, Federal and private landowners seeking comments concerning the proposed action and to people who had expressed interest in heli-ski operations on adjacent State lands near Thompson Pass. Public notices were printed in the Cordova Times, Valdez Vanguard, and Anchorage Daily News describing the proposal and asking for public input.

Issues - Issues for this project were identified through public and internal scoping. Similar issues were combined into one statement where appropriate. The following four issues were determined to be substantive and within the scope of the project decision. These issues are addressed through the proposed action and alternatives. Other concerns were raised but determined to be outside the scope of this project or not substantive to the project decision to be made. These concerns are discussed separately below.

Issue 1: There were concerns that providing guided heli-skiing could be noisy and could impact the recreation experience of users in the area, including noise and type of experience provided.

Issue 2: There were concerns that guided heli-skiing could have impacts on the wildlife habitat and populations in the area; specifically that helicopter noise and the visual presence of helicopters could affect wildlife, especially mountain goats.

Issue 3: There was a concern that guided heli-skiing could have effects such as trespass or unauthorized use on adjacent private lands and bordering state and BLM lands.

Issue 4: There was a concern that the number of permits issued for the area could have an effect on the safety of the users in the area.

The following public concerns were considered but are already addressed through other processes, in the Revised Forest Plan, or their resolution is beyond the scope of this project. As needed, resource effects related to these concerns are discussed in Chapter 3. These concerns are listed below.

- There was a concern that allowing commercial helicopter operations in roadless areas could affect whether the area could/would be considered for wilderness and wild and scenic river recommendations in the forest planning process currently underway or anytime in the future. This concern was addressed in the Revised Forest Plan. The entire Chugach National Forest was reviewed through a public process to determine which areas should be open or closed to commercial helicopter operations and other motorized uses, where wilderness designations were appropriate, which rivers were eligible for wild and scenic rivers designations and which rivers should be recommended for designation. Roadless areas were addressed as well in the Revised Forest Plan. The Revised Forest Plan does not recommend the project area for wilderness designation, and allows for winter-motorized use including helicopters in this area. For additional information regarding this concern refer to the Revised Chugach National Forest Plan.
- There was a concern that by establishing commercial helicopter use, the Forest Service is also helping to build a constituency that will oppose future wilderness recommendations for the permit areas. By allowing commercially guided public to use the area, a constituency may develop favoring this continued use. As indicated above, the Revised Forest Plan does not recommend the project area for wilderness designation, and allows for winter-motorized use including helicopters in this area. This analysis must conform to the direction provided by the Forest Plan and therefore this concern is clearly beyond the scope of this analysis.

- There was a concern that allowing commercial helicopter operations in roadless areas would set a precedent which would greatly decrease the odds of the permit area being considered for wilderness and wild and scenic river recommendations in the forest planning process now or in the future. This concern was previously addressed in the Revised Forest Plan. The Revised Forest Plan does not recommend the project area for wilderness designation, and it allows for winter-motorized use including helicopters in this area.

There would be no cumulative effects on roadless areas and their potential for wilderness classification because there would be no activities that would alter the physical setting or degrade wilderness values. The proposed helicopter use would not have a permanent effect on the physical environment nor preclude the area from being considered in a future revision effort. No facilities would be built and no trees would be cut in the project area. Winter helicopter skiing would have little effect on the character of the wilderness environment. Although, helicopter use would impact some wilderness values such as solitude, sense of remoteness, primitive recreation, self-reliance, and untrammeled natural state, such impacts would be temporary. Eliminating the use could reverse any impacts.

- There was a concern that the Forest Service needs to complete an EIS on the year round impacts of helicopters for the entire Chugach National Forest.

This issue is beyond the scope of this site-specific analysis. The Revised Forest Plan addresses open and closed areas for motorized use, including helicopters for all areas of the Chugach National Forest.

Applicable Laws and Executive Orders

Below is a list of federal laws and executive orders pertaining to project-specific planning and environmental analysis on federal lands. While most pertain to all federal lands, some of the laws are specific to Alaska.

- National Historic Preservation Act of 1966 (as amended)
- Multiple-Use Sustained-Yield Act of 1960
- Wild and Scenic Rivers Act of 1968, amended 1986
- Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended)
- American Indian Religious Freedom Act of 1978
- National Environmental Policy Act (NEPA) of 1969 (as amended)
- Clean Air Act of 1970 (as amended)
- Alaska Native Claims Settlement Act (ANCSA) of 1971
- Endangered Species Act (ESA) of 1973 (as amended)
- National Forest Management Act (NFMA) of 1976 (as amended)
- Clean Water Act of 1977 (as amended)
- Coastal Zone Management Act (CZMA) of 1972 (as amended)
- Alaska National Interest Lands Conservation Act (ANILCA) of 1980
- Archeological Resource Protection Act of 1980
- Executive Order 11593 (cultural resources)
- Executive Order 12898 (environmental justice)

State of Alaska - Under the Coastal Zone Management Act (CZMA) of 1972, as amended, Forest Service activities and development projects that affect the coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the Alaska Coastal Management Program (ACMP). Such “consistency determinations” are made by the Forest Service, and are reviewed by the State of Alaska as required by the CZMA. Helicopter skiing is not in a category identified by the Department of Governmental Coordination, ACMP, that needs a consistency review prior to permit issuance.

Planning Record - Additional documentation, including more detailed analyses of project area resources, may be found in the project planning record located at the Cordova Ranger District Office in Cordova, Alaska. Other reference documents such as the Revised Forest Plan are available at public libraries throughout Southcentral Alaska as well as at the Forest Supervisor's Office in Anchorage, Alaska. The Revised Forest Plan is also available at all other Alaska Forest Service offices, on the internet, and CD-ROM.

Chapter 2 - Alternatives

Introduction – This chapter describes and compares the alternatives considered by the Forest Service for the heli-ski project. It includes a discussion of how alternatives were developed, alternatives considered but not studied in detail, the alternatives studied in detail and a comparison of the alternatives by issue. Mitigation and monitoring efforts for the project are also summarized. Chapter 2 is intended to present the alternatives in comparative form, sharply define the issues and provide a clear basis for choice among the options by the decision maker and the public (40 CFR 1502.14). For a better understanding of the effects of the alternatives on the analysis area, readers can consult Chapter 3.

Alternative Development Process – The request to renew the special use permit for guided helicopter skiing was received in February 2001. Initially the analysis was limited to analyzing one operator, the original permit holder. However since there is more than one operator interested in providing these services in this area, the scope of the analysis was broadened to include consideration of more than one operator.

Helicopter skiing started in Valdez, Alaska in the early 1990's. It mainly consisted of extreme skiing events. Use was very limited. At that time use occurred primarily on State lands. However, more operators flying from Valdez and the Thompson Pass area created a desire to expand use to BLM and National Forest System lands in order to continue to provide a safe and quality experience for guided skiers. As described in chapter 1, in response to this increased demand, and as a result of the February 19, 1999 Chugach Powder Guides agreement, temporary (less than one year) special use permits were issued in 1998, 1999, and 2002 to a single operator within the analysis area. With the signing of the Forest Plan in May of this year, the Forest Service may freely select multiple operators should the analysis indicate multiple operators are acceptable.

Recreation Carrying Capacity Development - One of the first steps in developing the alternatives was to determine the recreation carrying capacity for the area and the existing demand. The carrying capacity is based on the acres in each ROS class present in the project area. The entire project area is classified as Primitive II. The area was divided into ski regions that the previous operator had used to split use. Table 2.1 displays the acres in each region, acres adjusted for suitability for use, and the resulting gross carrying capacity in PAOTS (people at one time). Acreages were determined as "suitable" if they could be skied by the heli-ski industry standard. Areas were determined to be unsuitable if they were excessively steep (severe cliffs) or existed on south facing slopes susceptible to the effects of the sun (little snow accumulation or unstable snow conditions). As an example, region 1 shows a suitability adjustment of .6. This means 60% of the area is considered suitable. All alternatives will provide a ROS class Primitive II type of recreation experience.

A Primitive II ROS class establishes that party sizes should not exceed 15 people and encounters between groups shall be one or less per day. The gross recreation carrying capacity for the entire analysis area is 348 people at one time (PAOTS) under a Primitive II prescription. The Revised Forest Plan states that a maximum of 50% of the total carrying capacity will be assigned to commercially guided services for backcountry, PII ROS, and 501 (b) prescriptions. The application of this standard is consistent within the analysis area. This results in a guided maximum commercial outfitter guide capacity of 174 PAOTS unadjusted for other factors such as goat habitat, inter-visible runs, other commercial users, and other wildlife habitat considerations.

It should be noted that “commercially guided” refers to all forms of guided activities (i.e. could include activities such as snow cat, ski plane, snow machine, dog sled, ski touring, etc.).

Table 2.1 Total Recreation Carrying Capacity based on acres of ROS class Primitive II.

Region	Gross acres	Suitability Adjustment	Adjusted acres	Estimated Capacity (PAOTS)
1	55,040	.6	33,024	66
2	23,040	.8	18,432	37
3	28,160	.85	23,936	48
4	28,160	.85	23,936	48
5	60,800	.8	48,640	97
6	26,240	.85	22,304	45
7	3,840	.9	3,456	7
Total acres	225,280		173,728	
Gross PAOTS				348

The interdisciplinary team (IDT) then considered what adjustments to the guided capacity would be needed to provide a safe experience, avoiding multiple party encounters per day, maintain a primitive II setting, and minimize impacts to goats. Current information on known goat habitat and known goat populations was determined by surveys conducted in the fall of 2001 and winter of 2002. Additional goat surveys will continue annually to verify location of winter goat habitat and use. This information will be used to add or drop areas from the permit. At this time goat habitat has been identified and confirmed in three regions which has resulted in eliminating two areas in region #1, one area in region #2 and relocating the potential fuel cache in region #3. The elimination of these areas did not result in any closure of any ski region or reduction in allowable people at one time (PAOT). However, in the future, should numerous areas be identified as goat habitat, safety is compromised for any reason, or the primitive II setting is not being met within any region there is a potential that the carrying capacity could be reduced to mitigate these affects. The maximum number of PAOTS for the analysis area (all seven regions combined) is 87 PAOTS/day for the 89 day season. This PAOT level would be adjusted either up or down as necessary to meet Forest Plan Standards and mitigation measures in this E.A. through yearly monitoring efforts.

There was also a concern regarding the number of helicopters that could safely work in the area at one time. The professional opinions of helicopter pilots and ski guides who have flown in the area was solicited. Pilot and guide opinions of safe numbers of operating helicopters ranged from 5 to 10 helicopters in the analysis area at one time. Based on this input, the IDT decided to start with an average figure of an eight (8) helicopter maximum, contingent on annual monitoring for safe operations. Between 1998 and 2002 no more than 4 helicopters operated commercially within the area at any one time.

Since heli-skiing is only one of the potential commercial winter guided activities within the analysis area, and to assure meeting the Primitive II ROS standards, wildlife concerns, and to maintain high safety standards, the IDT recommended that half of the total Commercial Guided Carrying Capacity be assigned as commercial heli-guided use to allow opportunity for growth of other commercial activities in the area. The carrying capacities by region are shown in Table 2.2.

The following requirements for permitted heli-skiing within the analysis area would be included within any heli-ski permit issued for the analysis area:

- 1) Maximum commercial heli-ski PAOT's for the entire analysis area (all regions) is 87 PAOT'S (regions 1 through 7). Note: If more than one operator is selected the PAOTS will be split between the operators.
- 2) The maximum group size for a Primitive II ROS setting is 15 people. The number of people on a single slope inter-visible to one another is 15 and the number of encounters per day between parties is one or less.
- 3) The maximum total PAOT use per day for the permit area of 87 PAOT's shall not be exceeded.
- 4) Eight helicopters is the maximum number of helicopters allowed in the permit area at one time.
- 5) If more than one operator and more than one permit holder is working in the total permit area (regions 1-7), at no time shall the sum total use of all operators and permit holders exceed 87 PAOT's and 8 (eight) helicopters at one time.
- 6) The Heli-ski PAOT capacity of 87 PAOT's (50% of the commercial capacity), may be distributed within each region up to the commercial capacity PAOT level until the 87 maximum PAOT capacity is reached, but must stay within ROS Primitive II guidelines for maximum group size and number of encounters per day and must meet all other mitigation measures listed. (see notes below for reasoning**)

Heli-ski PAOT Capacity by Region: (87 PAOT's Total)

-Reg 1; 16	-Reg 5; 24
-Reg 2; 9	-Reg 6; 12
-Reg 3; 12	-Reg 7; 2
-Reg 4; 12	

Commercial PAOT Capacity by Region: (174 PAOT's Total)

-Reg 1; 33	-Reg 5; 48
-Reg 2; 18	-Reg 6; 23
-Reg 3; 24	-Reg 7; 4
-Reg 4; 24	

**a. To allow for greater operator flexibility due to weather conditions, snow and skiing conditions, ease of access and access considerations, and therefore allow greater ability to adjust to changing conditions, would make use of the area more economically feasible and viable for the operator(s).

**b. Because very little use currently occurs within this area during this time period, it is expected using up to the commercial carrying capacity in any one region while staying within the heli-ski guided PAOT capacity (87 PAOT's) would have little or no effect on other commercial or non-commercial users.

**c. As use of this area from all commercial and non-commercial activities increases, potential conflict between user groups increases. Adhering to the heli-guided PAOT capacity for each individual region, and restricting helicopter use to only the PAOT capacity identified for helicopters in each region will likely become necessary as use of the area increases in the future.

**d. If through monitoring, using this approach compromises safety, primitive II ROS standards, or compromises wildlife or the other resources of the area below Forest Plan Standards or violates other mitigation measures identified, the heli-guided PAOT capacity for each region with an identified problem would be used as the maximum PAOT capacity for guided heli-ski use for the region.

Table 2.2 Carrying Capacity by Region

Region – acres	Total PAOTS (Commercial = 50%) (Non-commercial = 50%)	Commercial PAOT'S (this includes all types of commercial uses)	Heli-Guided PAOT'S (50% of Commercial PAOT's Assigned to Heli-Guided Use)
1. 55,040	66	33	16
2. 23,040	37	18	9
3. 28,160	48	24	12
4. 28,160	48	24	12
5. 60,800	97	48	24
6. 26,240	45	23	12
7. 3,840	7	4	2
Total	348	174	87

Alternatives Considered but Eliminated from Detailed Study – The following alternatives were considered during the planning process, but were not studied in detail. Some alternatives or modification to the proposed action were suggested during public scoping, but are outside the scope of this analysis. These are described briefly below, as well as the reasons for not considering them further.

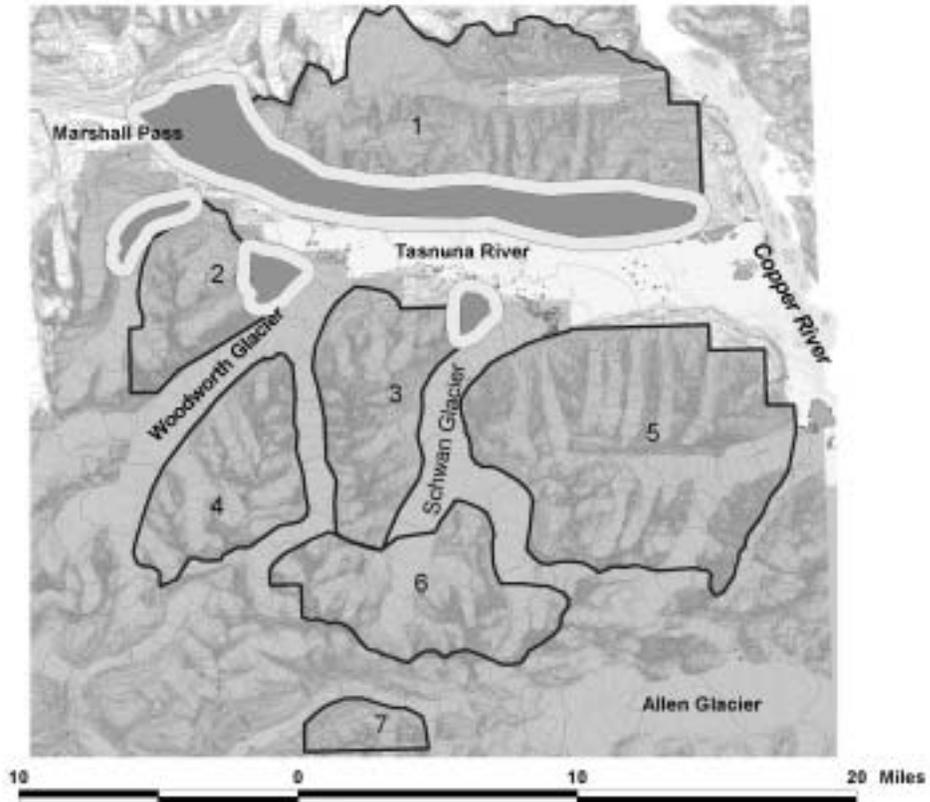
1. One suggestion was to increase the scope of the analysis to consider other areas on the Chugach National Forest and Cordova Ranger District for this activity. However, to increase the scope of this E.A. to include other areas of the Forest would require another carrying capacity analysis, re-scoping the public for new issues, development of new alternatives, and re-writing much of the 2001 E.A., requiring significantly more time. The IDT felt the public was better served by completing the EA for the existing analysis area at this time rather than potentially extending the process into another year, and miss the window for the 2003 heli-ski season.
2. Another suggestion was to allow more than one operator in each region. As identified in table 2.2 and on the analysis area map located in chapter 1, there are seven regions that make up the total analysis area. The potential for more than one group to be dropped off above another group, the associated avalanche hazards, the higher degree of risk associated with numerous permit holders, operators and helicopters working in smaller areas, and the expected reduced quality of the recreation experience all contributed in eliminating this suggestion from detailed study.
3. A third suggestion was the issuance of a long-term permit. New permits and new permit holders are generally authorized using a shorter (1-2 year) permit length that includes a probationary period. A temporary or short-term permit allows the permitted activity to progress at a slower rate and allows for monitoring and adjustment of activities more easily. Once effects are better known, and permit holders have performed successfully the use may be authorized for a 5-year term. Permits issued as a result of this document will start out as short term permits (one year) and include a probationary period.

Items Common to All Alternatives – All alternatives are consistent with the Revised Chugach Forest Plan. All applicable forest-wide standards and guidelines, and best management practices have been incorporated. Additional direction comes from applicable Forest Service manuals and handbooks.

All alternatives will provide a ROS class Primitive II (PII) type of recreation experience. This class establishes that the party size should not exceed 15 people and encounters between groups shall be one or less per day. The gross recreation carrying capacity for the area is 348 people at one time (PAOTS) under a PII prescription. The Forest Plan states that a maximum of 50% of the total carrying capacity be allocated to commercially guided publics. Of the 348 total PAOT Carrying Capacity for this area, the portion allocated to commercially guided activities was 50% or 174 PAOT's. Since heli-skiing is only one of the potential commercial winter guided activities within the analysis area, and to assure meeting the Primitive II ROS standards, wildlife issues and concerns, and to maintain high safety standards, the IDT recommended that half of the total Commercial Guided Carrying Capacity be assigned as commercial heli-guided use. Of the guided capacity ½ or 87 PAOTS is assigned to heli-ski operations (refer to Table 2.2 Carrying Capacity by Region).

All alternatives will route helicopters and skiers away from goat habitat and potential goat habitat. Helicopters will not land within ½ mile of these areas, and helicopters must fly a minimum of 1,500 feet in elevation above the surface if these areas are crossed. Helicopters will stay at least 1,500 foot minimum vertical distance from all observed goats and sheep. Skiing will only be permitted on those runs approved through flight surveys; labeled and identified within the special use permit. The map on the following page labeled Winter Mountain Goat Habitat Cordova Ranger District Chugach National Forest shows the area of known winter goat habitat at this time. All alternatives will be subject to monitoring and modification of ski-able areas if necessary. Spring surveys will be flown to verify goat habitat areas, and ski boundaries may be shifted depending on the results. Inclusion of additional areas will only occur if goat habitat does not occur within the area.

**Winter Mountain Goat Habitat
Cordova Ranger District
Chugach National Forest**



- Winter Goat Habitat
- 1/2-mile Buffer
- Heliski Regions
- Land Ownership**
- Eliminated NFS Lands
- National Forest Lands
- Native Lands
- Municipal, Private, & Other
- Aquired NFS Lands
- State Lands
- Water

* Ski runs located in any goat habitat or buffers not authorized for use.



PM-SK 11/15/2001

Alternatives Considered in Detail –Alternative 1 is the “no-action” alternative, under which no special use permit for guided helicopter skiing would be issued. The other alternatives represent different means of satisfying the purpose and need by responding with different emphases to the issues discussed in Chapter 1. Alternative 1 – “no-action, Alternative 2 – One Operator, Alternative 3 – Two Operators (proposed action), and Alternative 4 – Three or More Operators are each considered in detail in this analysis.

Alternative 1 - No Action. The emphasis of this alternative is to not issue any special-use permits for helicopter guided skiing for the project area at this time. It does not preclude issuing helicopter guided skiing permits for other areas at this time or for the Tasnuna - Cleave Creek area at some time in the future. The Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14d) require that a "no action" alternative be analyzed in every E.A. Alternative 1 also responds to Issues 1 and 2 since no guided helicopter use would be allowed in the area noise from helicopters would be less. It does not preclude unguided publics from chartering a helicopter and heli-skiing in the area. This alternative represents the pre-existing condition prior to issuance of previous temporary 1-year permits against which the other alternatives are compared. VHSG's Special Use Permit will expire December 31, 2002. In this alternative, a new permit would not be issued and the proposed guided helicopter skiing would not be allowed. No client-days would be permitted.

Alternative 2 - One Operator. Under this alternative a probationary one-year special use permit to a single operator would be issued for the entire project area for conducting helicopter supported skiing within 7 regions totaling 225,280 acres. The season of use would be from February 1st through April 30th (89 days) and could be extended, upon request, if conditions warrant. Based on the recreation carrying capacity for the area, a maximum of eight helicopters and 87 persons at one time (PAOTs) would be allowed for the 89 days.

Alternative 3 (Proposed Action) - Two operators. Under this alternative one-year special use permits would be issued to two operators for conducting helicopter supported skiing within 7 regions totaling 225,280 acres. A prospectus would be used to select the successful applicants and one-year probationary permits issued. Following the probationary periods, subsequent permits may be issued contingent upon successful operations and acceptable performance by the permit holders. The seven regions would be split between the two operators in such a way that they would not use the same runs at the same time. The season of use would be from February 1st through April 30th (89 days) and could be extended, upon request, if conditions warrant. Based on the recreation carrying capacity for the area, a maximum of eight helicopters and 87 persons at one time (PAOTs) would be allowed for the 89 days.

Alternative 4 - Three or more operators. Under this alternative, probationary one-year special use permits would be issued to three or more operators for conducting helicopter supported skiing within 7 regions totaling 225,280 acres in the analysis area. The seven regions would be split between the operators in such a way that they would not use the same runs at the same time. The season of use would be from February 1st through April 30th (89 days) and could be extended, upon request, if conditions warrant. Based on the recreation carrying capacity for the area, a maximum of eight helicopters and 87 persons at one time (PAOTs) would be allowed for the 89 days.

Mitigation Measures Common to all action Alternatives - This EA discloses the possible adverse impacts that may occur from implementing each alternative. Measures have been formulated to minimize or avoid these impacts. These measures were guided by the direction from and standards and guidelines of the Revised Chugach Forest Plan previously described.

Mitigation for noise and Recreation Experience - Recommended flight paths and flight altitudes, and other mitigation measures listed below would be listed under "permit stipulations" as an exhibit of the permit. The area is managed for motorized uses and the proposed action is consistent with Revised Forest Plan (PII ROS).

The following mitigation measures will be included within the special use permit to minimize effects on recreation experiences and quiet:

- All helicopters will maintain a 2,500-foot vertical and horizontal distance from all observed users as weather and ceilings allow. If weather or other conditions do not allow compliance with the above distances, the helicopter will maintain the greatest vertical and horizontal distances safely possible.
- Flight paths in and out of rural areas should not occur over residential areas
- Individual parties will be no larger than 15 people and flights will be conducted in a manner to limit encounters between parties (including unguided parties) to one or less per day.
- Explosives will not be used for avalanche control.
- Helicopters exiting from the Thompson Pass area will fly through Marshall Pass. If the operator selected is Cordova based, helicopters will avoid flying over the City of Cordova and adjacent mountain tops accessible by cross-country skiers.
- All helicopter skiing operations will occur during daylight hours between sunrise and sunset daily.
- The use of an A-Star helicopter is encouraged because they carry more passengers and generate less noise than other available helicopters.
- All FAA safety requirements will be followed.
- No more than eight helicopters will be allowed within the permit area at one time.
- No more than 87 heli-ski PAOTS will be allowed within the permit area at one time.
- Heli-ski operators will work exclusively within assigned regions in order to reduce the potential for conflict or placement of skiers above other skiers (reduces avalanche potential).
- Heli-ski operators must use GPS equipment and maps to insure their activities occur on the National Forest and not on private or other agency lands where their activities are not authorized.
- If more than one operator and more than one permit holder is working in the total permit area (regions 1-7), at no time shall the sum total use of all operators and permit holders exceed 87 PAOT's and 8 (eight) helicopters at one time.
- The heli-ski PAOT capacity of 87 PAOT's (50% of the commercial capacity), may be distributed within each region up to the commercial capacity PAOT level until the 87 maximum PAOT capacity is reached, but must stay within ROS Primitive II guidelines for maximum group size and number of encounters per day and must meet all other mitigation measures listed.

Mitigation for goats and other wildlife - Areas of known or potential goat habitat will not be authorized for heli-skiing. Current information indicates a minimum distance of 1/2 mile does not disturb goats; continuing research may increase or decrease this distance. It is likely that wolverine, black bear and brown bear use the area. The following Mitigation Measures will be to minimize or avoid adverse effects on wildlife:

- Helicopters will not hover, circle, or harass wildlife or waterfowl in any way.
- Helicopters will maintain a minimum landing distance of 1/2 mile (0.8 kilometer) from all observed wildlife.
- Pilots will use flight paths that avoid mountain goats and their habitat.
- Helicopters shall not land within 1/2 mile of any area marked winter goat habitat as shown on the map labeled “Winter Mountain Goat Habitat Cordova Ranger District Chugach National Forest”.
- Helicopters will maintain a minimum vertical distance of 1,500 feet above all observed mountain goats or Dall sheep as well as above the surface in areas marked “goat habitat” on the attached map labeled “Winter Mountain Goat Habitat Cordova Ranger District Chugach National Forest”
- The special use permit will include an advisement from Alaska Department of Fish and Game that Alaska Statutes 16.05.940 defines “taking” to include pursuing or in any manner disturbing fish or game. Helicopter use within this area may disturb and therefore illegally take mountain goats. The permit would state that unlawfully pursuing or deliberately disturbing mountain goats would result in permit revocation.
- Helicopter landings will not occur from May 15 through June 15 to avoid goat kidding period.
- Skiing will be limited to those areas outside goat habitat as shown on the attached map labeled “Winter Mountain Goat Habitat Cordova Ranger District Chugach National Forest”. Specific allowable ski runs will be shown on maps included as an exhibit of the special use permit (s).
- Skiers and operators will not approach within 330 feet of eagle or osprey nests and within 660 feet of goshawk nests.
- Heli-ski operators will report wildlife sighting information to the Forest Service.

Monitoring - The National Forest Management Act requires National Forests to monitor and evaluate their forest plans (36 CFR 219.11). Chapter 5 of the Forest Plan includes the monitoring and evaluation activities to be conducted as part of Forest Plan implementation. There are three categories of Forest Plan monitoring.

- **Implementation monitoring.** Used to determine if the goals, objectives, standards and guidelines and practices of the Revised Forest Plan are implemented in accordance with the Revised Forest Plan.
- **Effectiveness monitoring.** Used to determine if the implementation of the Revised Forest Plan is achieving its objectives and whether the objectives are achieving goals.
- **Validation monitoring.** Used to determine whether the data, assumptions, and estimated effects used in developing the Revised Forest Plan are correct.
- **Baseline Questions.** Used to examine whether the assumptions and predicted effects used to formulate the Revised Forest Plan are correct.

Effectiveness and validation monitoring of Forest Plan Standards and Guidelines are not typically done as part of project implementation. Implementation monitoring, and any additional project specific monitoring, are important aspects of the project.

Routine Implementation Monitoring

Routine implementation monitoring assesses whether the project was implemented as designed and whether or not it complies with the Revised Forest Plan. Planning for routine implementation monitoring began with the development of special-use permit stipulations. The comment cards filled out by Forest users and guided public will be the basis for determining whether recreation experience is being met as well as safety concerns.

Routine implementation monitoring is a part of the administration of a special-use permit. The District ensures that the mitigation measures and guidelines are incorporated as requirements or stipulation in the Special-use permit. They then monitor performance relative to contract requirements. Input by resource staff specialists, such as wildlife biologists is requested during this implementation monitoring process. The specialists provide technical advice when questions arise during project implementation.

Chugach National Forest Staff annually conduct a review of Best Management Practices (BMPs) implementation and effectiveness. The results of this and other monitoring are summarized in a Chugach National Forest annual Monitoring and Evaluation Report. This report provides information about how well the management direction of the Forest is being carried out, and measures the accomplishment of anticipated outputs, activities and effects.

Project specific monitoring of goat populations and habitat will continue on an annual basis through flight surveys. Changes in suitable habitat or population locations may justify modifying areas open to heli-skiing. Surveys will also be used to determine whether heli-ski operators are skiing within the ski run boundaries and to determine if Primitive II ROS standards and carrying capacity PAOT standards are being followed and if heli-guided PAOT capacities for the area should stay the same or be adjusted up or down.

Outfitter/Guide special use permits are reviewed and evaluated annually. If operators are deficient in areas of their Operation and Safety Plans or permit requirements they are given an opportunity to correct deficiencies. If the operator is not successful in correcting deficiencies action is taken to revoke the permit. Monitoring and evaluation of number of helicopters operating in the area will continue to determine if eight helicopters maximum is the appropriate safe number and to continue monitoring the potential for affects to other users. This monitoring will be conducted by the Forest Service permit administrator and will be accomplished by contacting the permit holder, helicopter pilots, and randomly selected clients.

Comparison of Alternatives by Issue - This section provides a comparison of the alternatives focusing on the significant issues. For more detailed descriptions of the affected environment and the environmental consequences of the alternatives, refer to Chapter 3.

Introduction: All alternatives allow for a maximum of eight helicopters and 87 persons at one time (PAOTs) for 89 days or 7,743 client days mathematically possible annually. A single operator would likely average 2-4 helicopters at a time and theoretically would average approximately 3 helicopters per day (based on past use, current size of helicopter operators in the area, and anticipated future use). Using this logic, two operators would use approximately 4-8 helicopters at a time, or average six (6) helicopters per day, and 3 or more operators would average nine (9) helicopters per day exceeding the constrained maximum limit of eight helicopters.

As a basis for comparison of alternatives by issue, this analysis will assume an average of zero helicopters for the “no action” alternative (alternative 1), 3 helicopters average daily use within the permit area for one operator (alternative 2), 6 helicopters average daily use within the permit area for two operators (alternative 3), and 8 helicopters (maximum limit reached) average daily use within the permit area for three or more operators (alternative 4).

In 2002 VHSG operated for the months of March and April (61 days) with 704 client days. Of the 61 days, they were unable to fly 25 days (41%) due to weather or other reasons. This amount of use is well within PAOT limits and Primitive II ROS standards identified within this analysis and is considered low-use for the overall analysis area (all seven regions combined). The addition of other operators to the area would incrementally increase the amount of use and subsequent noise and incrementally change the type of recreational experience available to heli-ski clients with increasing use.

Issue 1: What is the effect of the providing guided heli-skiing on the recreation experience of users in the area, including noise and type of experience. Specifically, how would the noise from helicopter take-offs, landings, and overflights affect other users of the area and people along the flight paths?

Effect of Alternative 1 (No Action—i.e., no permits issued), -

No permitted commercial heli-ski operations would take place on National Forest System lands in the analysis area. This alternative represents a reduction in the current permitted use by one operator. There would be fewer environmental consequences from helicopter noise or visual presence than for the other alternatives. However, the Forest Service does not control flight seeing or flight paths over the Chugach National Forest, and private unguided groups could rent a helicopters or fixed-wing aircraft and ski the area without a permit.

Because no commercial heli-skiing helicopters would be using the area under this alternative, overall use by helicopters and noise from commercial helicopters would be very low. As a result, the Primitive II ROS recreational experience (see Table 1.1) including a high degree of solitude, low number of encounters between groups, and a “primitive” experience by recreational users of the area, would be highly met.

Effect of Alternative 2 - (One Operator) –

Under this alternative a single operator would be permitted to conduct commercially guided heli-ski services within the seven regions of the permit area from February 1st through April 30th. A maximum of eight helicopters and 87 persons at one time (PAOTs) would be allowed for the 89 days.

As described in the introduction, it could be assumed that an average of three helicopters per day would be located within the permit area at one time. Past permitted helicopter skiing used 2 to 4 ships and 470 -704 (2002 figure) client days, well within the established commercial carrying capacity (7,743 client days). The operator would function under a Forest Service Special Use Permit and would be required to adhere to any terms and mitigation measures included under such an authorization. The authorization would be monitored annually to determine if the effects are within the acceptable range. If not, the permit would be modified.

Other known use in the area is very light in numbers (estimated less than 20 users from February-May) but there is a potential for a negative effect on other non-guided heli-skiers, snowmobilers, back country skiers or snowshoe travelers. With as many as eight and as few as a single helicopter (or no helicopters) operating within the region there is a range of potential exposures and effects. The greater the number of helicopters operating in the area the greater the potential may be for impacts on other users. Because the ROS designation of the area is *P-II; Primitive-Motorized* the expectation of recreation users of the area is to see or hear little or no evidence of human activity. However if activity was noted it would be acceptable for that activity to be of the “motorized” variety.

Noise- Helicopters are generally known to generate a lot of noise particularly at close distances. The potential for impacts is likely and may be objectionable to some users. Some users may be more tolerant to motorized noise. Users within the same activity group (eg. Heli-skiing) would likely be the most tolerant. Some users may find helicopter noise very objectionable particularly at close range and others may not find it objectionable at all or only mildly objectionable. Close overflights and take-offs/landings may have the greatest potential for impacts.

Typically a single helicopter will service as few as five or as many as twenty skiers. A series of short flights (five minutes from Thompson Pass to the ski area) are necessary to move skiers to the general ski area and then from run to run. An average day of skiing would mean 8-10 runs per skier and there would be 2-3 flights for fueling. The activity would generally occur for periods within one or two ski regions but would require numerous take-offs and landings to service a group of skiers.

An average day for a single ship with 10 skiers and three fuelings would mean a total of approximately 59 landings and take-offs within the ski area over a maximum possible period of hours or approximately one landing/take-off on average of every 9.1 minutes. Based on the assumption that one operator would average three ships in the area at one time, it can be assumed that three ships would generate three times the take off and landings as one ship. These ships are likely to be separated by sight and distance (although probably not sound) from each other for most of the time due to the large size of the area and the availability of seven regions to spread operations around in.

Landings/take-offs and fly-byes however will likely be incrementally less objectionable to other users with greater distance. For users near the primary flight paths of numerous helicopters the exposure rate may be obtrusive.

Experience- The recreational experience of users is directly related to the expectation associated with a given ROS class. Recreation experience can be affected by visual stimuli as well as auditory stimuli as described above. In the *primitive II* ROS users expect few or no visual indications of human activity. The sight of helicopters may seem out of place in such a remote and primitive setting although acceptable under a **P-II; Primitive-Motorized** ROS. With as many as 2-4 helicopters and an average of three helicopters operating within the region there is a range of potential exposures and affects. For users near the primary flight paths and landing zones of helicopters the exposure rate may be obtrusive. As described under “noise” (above) heli-skiing by nature generates multiple shuttles of skiers from run to run which incrementally increase as helicopters and skiers increase. There is a potential of three helicopters operating at all times during a day within one to three regions of the ski area. With the implementation of mitigation measures discussed under “Mitigation for Noise” (Pg. 20) the effects to most users should be minimal.

As the number of heli-ski operators increases in the area from alternative 2 (single operator) to alternative 3 (two operators) to alternative 4 (three or more operators), the type of recreational experience provided to heli-ski and non-heli-ski users of the area will change. The desired ROS setting prescribed for this area in the Revised Forest Plan is Primitive II (primitive-motorized). The type of recreational experience expected by users of this area (see Table 1.1 Recreational Opportunity Spectrum Class Characteristics) under a PII ROS class are for a high degree of solitude, a very low expectation of encountering other groups (expected one or less parties per day), a very high degree of risk and challenge, and a maximum party size of 15.

As the number of operators and helicopters working in the area increases it can be expected that the degree of solitude for users will decrease, the likelihood of encountering groups will increase, and the “primitive” characteristics which people would be looking for in using this area would decrease. Because the analysis area includes a very large area (approximately 225,000 National Forest System acres) spread out between 7 (seven) regions, it is expected use by one operator (**alternative 2**, estimated 3 helicopters average) or two operators (**alternative 3**, estimated 6 helicopters average) would be largely absorbed by the size of the area and regions within which to spread out the people and use. It is also expected that communication and coordination between helicopters from two companies (permit holders) is expected to be very good, which would result in fewer fly-bys, encounters between groups, and a greater degree of dispersal between regions.

Effects of Alternative 3 (Two Operators)-

Under this alternative two operators would be permitted to conduct commercially guided heli-ski services within the seven regions of the permit area from February 1st through April 30th. A maximum of eight helicopters and 87 persons at one time (PAOTs) would be allowed for the 89 days. Past permitted helicopter skiing (single operator) used 2 to 4 ships and 470 - 704 (2001 figure) client days, well within the established commercial carrying capacity (7,743 client days).

As described in the introduction, it could be assumed that an average of six (6) helicopters per day would be operating within the permit area at one time with two operators permitted to use the seven regions. Two operators on the average would use twice as many helicopters as one operator (average of six (6) helicopters per day within the permit area) which would result in approximately twice as many take offs and landings, and cause approximately twice as much noise and potential disturbance to others.

Because the two permit holders would have seven regions to operate within, guided use of an average of six (6) helicopters per day could be dispersed between the regions. By dispersing this use to different regions, the affects of noise and fly bys on other groups using the area would be greatly reduced. Standards for a primitive II ROS would be met but would need to be monitored to assure compliance.

Other known use in the area is very light in numbers (estimated less than 20 users February-May) but there is a potential for a negative affect on other non-guided heli-skiers, snowmobilers, back country skiers or snowshoe travelers. With a potential range of 4-8 helicopters and an average of six (6) helicopters per day within the heli-ski area there is a range of potential exposures and effects. The greater the number of helicopters operating in the area the greater the potential may be for effect on other users. Because the ROS designation of the area is ***P-II; Primitive-Motorized*** the expectation of all recreation users of the area is to see or hear little or no evidence of human activity. However if activity was noted it would be acceptable for that activity to be of the “motorized” variety.

Noise- Helicopters are generally known to generate a lot of noise particularly at close distances. The potential for affects are greater than alternative two because approximately twice as many helicopters are likely to be within the ski area at one time that would generate approximately twice as much noise as a single operator. It is less likely that other users would be able to become acclimated to motorized noise and more tolerant. Users within the same activity group (eg. heli-skiing) likely will be the most tolerant. Some users may find helicopter noise very objectionable particularly at close range and others may not find it objectionable at all or only mildly objectionable. Close overflights and take-offs/landings may have the greatest potential for impacts. Helicopters will likely service as much as twice as many skiers for twice as many flights, take-offs and landings. Landings/take-offs and fly-bys however will likely be incrementally less objectionable to other users with greater distance. For users near the primary flight paths of numerous helicopters the exposure rate may be more obtrusive. Exposure to noise along primary flight paths would be greater than alternative two.

Experience- As indicated previously the recreational experience of users is directly related to the expectation associated with a given ROS class. Recreation experience can be affected by visual stimuli as well as auditory stimuli as described above. In the ***primitive*** ROS users expect few or no visual indications of human activity. This alternative has approximately twice the potential as alternative 2 for encounters between commercially guided ski groups or other users because an average of six helicopters would be operating within the permit area at one time with two operators as compared to an average of three helicopters with one operator. The sight of helicopters may seem out of place in such a remote and primitive setting although acceptable under a ***P-II; Primitive-Motorized*** ROS. With the potential of as many as 4-8 helicopters and an average of six helicopters using the area at a single time there is a range of potential exposures and affects. As described under “noise” (above) heli-skiing by nature generates multiple shuttles of skiers from run to run

which incrementally increase as helicopters and skiers increase. The greater the number of helicopters operating in the area the greater the potential for affects on heli-skiers and other recreationists.

As the number of operators and helicopters working in the area increases it can be expected that the degree of solitude for users will decrease, the likelihood of encountering groups will increase, and the “primitive” characteristics which people would be looking for in using this area would decrease.

Because the analysis area includes a very large area (approximately 225,000 National Forest System acres) spread out between 7 (seven) regions, it is expected use by one operator (**alternative 2**, estimated 3 helicopters average) or two operators (**alternative 3**, estimated 6 helicopters average) would be largely absorbed by the size of the area and regions within which to spread out the people and use. It is also expected that communication and coordination between helicopters from two companies (permit holders) is expected to be very good, which would result in fewer fly-bys, encounters between groups, and a greater degree of dispersal between regions.

With the implementation of mitigation measures discussed under “Mitigation for Noise” (Pg. 20) the effects to most users should be minimal because of the ability to disperse use throughout the seven regions. The operators would function under a Forest Service Special Use Permit and would be required to adhere to any terms or mitigation measures included under the authorizations. The authorizations would be monitored annually to determine if the effects are within the acceptable range. If not, permit language may be modified to become more or less restrictive.

Effects of Alternative 4 (Three or More Operators):

Under this alternative three or more operators would be permitted to conduct commercially guided heli-ski services within the seven regions of the permit area from February 1st through April 30th. A maximum of eight helicopters and 87 persons at one time (PAOTs) would be allowed for the 89 days.

As described in the introduction, it could be assumed that the constrained maximum limit of eight (8) helicopters per day would be operating within the permit area at one time with three or more operators permitted using the seven regions. This alternative would on the average result in nearly three time as many take offs and landings, and cause approximately three times as much noise and potential disturbance to others as alternative 2, and would result in more noise and potential disturbance than alternative three, two, or one.

Because the three permit holders would have seven regions to operate in, guided use with an average of eight (8) helicopters per day could be dispersed between the regions, but not as effectively as in the other alternatives. By dispersing this use to different regions, the affects of noise and fly bys on other groups using the area could be reduced, but because the constrained maximum of eight helicopters would be operating nearly all the time in this alternative, the affects of noise and fly bys on other users would be greatest for alternative 4.

As the number of operators increases, the likelihood of limited or no communication between pilots of competing companies occurring increases. Less coordination and cooperation between operators would also likely result in increased levels of fly-bys, noise, and disturbance to others. Standards for a primitive II ROS would be met, but would have a

higher potential to be exceeded, and would need to be monitored to assure compliance. Three or more operators would have the potential to use as many as 12 or more helicopters. However, since a maximum number of eight helicopters has been set, the operators would be required to schedule flights in such a way as to insure no more than eight helicopters would be in operation at one time over the entire area

Other known use in the area is very light in numbers (estimated less than 20 users February-May) but there is a potential for a negative affect on other non-guided heli-skiers, snowmobilers, back country skiers or snowshoe travelers. With the potential of as many as eight helicopters operating within the region there is a range of potential exposures and effects. The greater the number of helicopters operating in the area the greater the potential may be for effect on other users. Because the ROS designation of the area is ***P-II; Primitive-Motorized*** the expectation of recreation users of the area is to see or hear little or no evidence of human activity. However if activity was noted it would be acceptable for that activity to be of the “motorized” variety.

Noise- Helicopters are generally known to generate a lot of noise particularly at close distances. The potential for affects from noise are greatest under alternative 4. Approximately three times as many helicopters are likely to be in the analysis area at one time under alternative 4 than with a single operator (alternative 2) and therefore approximately three times as much noise could be expected from this helicopter use. Affects are likely and may be objectionable to some users. It is possible other users may have become more acclimated to motorized noise and more tolerant. Some users may find helicopter noise very objectionable particularly at close range and others may not find it objectionable at all or only mildly objectionable. Close over flights and take-offs/landings may have the greatest potential for impacts. Helicopters likely will service as much even more skiers than alternative three for more flights, take-offs and landings. Landings/take-offs and fly-byes however will likely be incrementally less objectionable with greater distance. For users near the primary flight paths of numerous helicopters the exposure rate may be obtrusive. Exposure to noise along primary flight paths would be greatest under alternative four.

Experience- As described, the recreational experience of users is directly related to the expectation associated with a given ROS class. Recreation experience can be affected by visual stimuli as well as auditory stimuli as described above. In the ***primitive*** ROS users expect few or no visual indications of human activity. This alternative has the greatest potential for encounters between commercially guided ski groups. The sight of helicopters may seem out of place in such a remote and primitive setting although acceptable under a ***P-II; Primitive-Motorized*** ROS.

With the constrained maximum limit of eight (8) helicopters operating in the analysis area at one time on the average, the potential for exposure to other heli-ski groups and from other helicopters using the area is high. As described previously under “noise” heli-skiing by nature generates multiple shuttles of skiers from run to run which incrementally increase as helicopters and skiers increase. This alternative represents the greatest potential for shuttling flights which could occur at a near constant level daily with up to eight helicopters operating in all regions. The greater the number of helicopters operating in the area the greater the potential for affect may be to the recreation experience of other people in the area.

If three or more operators (**alternative 4**, maximum constrained limit of eight helicopters) were operating in the area nearly continuously on good operating days, the ability of the area and seven

regions to absorb this additional use would be decreased. Also, because (estimated eight) helicopters from three or more companies would be competing for air space, and communication and coordination between (three or more) competing companies would be expected to be less, it is expected a higher number of fly-by's would occur, noise levels would be greater, encounters between groups would increase, and the feeling of solitude and of being in a pristine, primitive setting would be diminished.

Each operator would function under a Forest Service Special Use Permit and would be required to adhere to any terms or mitigation measures included under the authorizations. The authorizations would be monitored annually to determine if the affects are within the acceptable range. If not, permit language would be modified to become more or less restrictive.

Table 2.3 - Comparison of Alternatives

Alt. #	1 (no operator)	2 (one operator)	3 (two operators)	4 (3 or more operators)
Range of helicopters by alt.	0	2-4	4-8	6->10
Avg. # of helicopters	0	3	6	8
Avg. # of take- offs/landings. Assume 59/day/helo.	0	177	354	472
Exposure to Noise 0=least, 3=greatest	0	1	2	3
Opportunity for high quality heli-ski experience	Low	High	High	Mod.
Potential for helicopter safety issues occurring	Very Low	Low	Low	Mod.

** Eight is the maximum number of helicopters allowed in the analysis area at one time. Because numerous (three or more) operators could potentially have more than eight helicopters available to operate in the area at any one time greater than 10 helicopters potentially available is the estimate shown on the chart. At no time would more than eight helicopters (the maximum limit) be allowed in the analysis area. The number of helicopters allowed in the area (eight maximum) will be monitored and adjusted as necessary to meet safety, ROS PII Standards, and other mitigation measures identified.

Issue 2: What impacts will guided heli-skiing have on the wildlife habitat and populations in the area? How would helicopter noise and the visual presence of helicopters affect wildlife, especially mountain goats?

Effect of Alt 1 (no action, – i.e. no permits issued) -

Not permitting guided helicopter skiing would be a reduction from the current use of a single operator. This alternative results in fewer environmental consequences from helicopter noise and visual presence than the other alternatives. However, the Forest Service does not control flight seeing or flight paths over National Forest System lands, and private unguided groups could rent a helicopter or fixed-wing aircraft and ski the area without a permit. With the increased popularity of heli-skiing this type of private activity will likely increase. These activities are expected to be low, however, and effect of alternative 1 on wildlife would be negligible.

Effect of Alt 2- (one operator)

Alternative 2, 3, and 4 will all have similar impacts on mountain goats and other wildlife. All alternatives will have the same limit on the number of helicopters allowed per day. In addition, all alternatives will be restricted by the same mitigation measures (pg. 21). Because Alternative 2 allows only a single operator (three helicopters average in the permit area on most skiable days), and Alternative 3 allows two operators (six helicopters average in the permit area on most skiable days) however, the chances of reaching the limit of use is less than in Alternatives 4 (eight helicopters average in the permit area on most skiable days). Therefore we would expect somewhat fewer disturbance events under Alternative 2 than under Alternatives 3 than under Alternative 4. Effects on wildlife under Alternative 2 are expected to be negligible to low.

Effect of alt 3 – (two operators)

Under Alternative 3, we would expect an average of six (6) helicopters in the permit area at one time on most skiable days. This situation could potentially cause more disturbance to wildlife than Alternative 1 or 2. However, the mitigation measures (pg. 21) associated with this permit should reduce the potential for disturbance and result in minimal impacts. We expect that the effects of alternative 3 on wildlife species be negligible to low.

Effect of alt 4 – (three or more operators)

Under Alternative 4, we would expect to reach the allowable limit of helicopter use (8) on most skiable days. This situation could potentially cause the greatest amount of wildlife disturbance. However, the mitigation measures (Pg. 21) associated with this permit would reduce the potential for disturbance and result in minimal impacts. We expect that the effects of alternative 4 on wildlife populations would be negligible to low for all species.

Issue 3 - What effect will guided heli-skiing have on adjacent private lands and bordering state and BLM lands?

Effect of Alt 1 (no action, - i.e. no permits issued) –

Not permitting guided helicopter skiing - would represent a reduction in the current use on National Forest System lands. The Forest Service does not control flight seeing or flight paths over the National Forest, however, private groups of individuals could rent a helicopters or fixed-wing aircraft and ski the area without a permit. Under this alternative little change to the existing condition would occur but use on other lands would likely increase since commercial heli-ski activities would not be allowed on the National Forest.

Effects of alt 2, 3, and 4 – (1, 2, or multiple operators) -

Under these alternatives one or more operators would be permitted to conduct commercially guided heli-ski services within the seven regions of the permit area from February 1st through April 30th. A maximum of eight helicopters and 87 persons at one time (PAOTs) would be allowed for the 89 days. The special use permit(s) would require the use of GPS equipment and updated maps to ensure clients and guides were not trespassing on private land. Private lands adjacent to the National Forest also tend to be self-limiting because of their lower elevations relative to the preferred ski zones. Snow accumulations would be less and dense alder would discourage the use of private lands.

Low elevation lands within the Cleave Creek and Tasnuna River drainages are predominately private owned. Since these areas may have more suitable conditions for flying than those areas higher in elevation they would likely become primary access corridors for the helicopters. With as many as eight and as few as a single helicopter (or no helicopters) operating within the region there is a range of potential exposures and effects. Private landowners have not commented on the potential for increased air traffic or noise.

Adjacent State and BLM lands are open to commercially guided helicopter use. Both are less restrictive than Forest Service standards. Authorizing use on the National Forest System lands in the analysis area would likely have little adverse effect on these lands and may reduce the use on other agency lands through dispersal.

Issue 4 - What is the effect of the number of permits issued for the area on safety of the users in the area.

A mountainous environment always has some risk that is assumed by the people engaging in outdoor activities. This is true of helicopter skiing. However, careful planning and execution can minimize this risk. The Forest Service requires detailed Operations and Safety Plans from all heli-ski operators which must include a detailed: 1) Communications Plan: 2) Aircraft Operations Plan: 3) Hazards Evaluation and Forecasting Plan (including flight conditions, avalanche assessment, fueling and weather) and: 4) Emergency Procedures and Mobilization Plan. Helicopter pilots are required to follow FAA regulations. For heli-skiers, as well as other skiers and snowmobilers, avalanches and backcountry travel pose one of the greatest risks. Proper preparedness and good management of that risk depends on knowledge of current snow conditions and the ability to accurately predict snow stability (avalanche forecasting), and backcountry survival. It is

a continuous process of integrating pertinent data, which begins before the first snow of winter and ends when the snow pack is gone.

The effect of the number of permits issued for the area on the safety of the users in the area varies by alternative, but is felt to be lowest risk or highest degree of safety for alternative 1, low risk and high degree of safety for alternatives 2 and 3, and higher risk and lower degree of safety for alternative 4. A discussion follows:

Effect of Alt 1 (no action, no permits issued) –

Not permitting guided helicopter skiing would result in a reduction in the level of use currently permitted. This alternative would leave the project area accessible primarily to cross-country skiers, ski touring, private groups that use fixed-wing aircraft or helicopters to access ski terrain, or snow machines. The amount of activity associated with commercial heli-skiing would be removed from the area and there would be a reduction in overall use of the area. Because this alternative results in the least amount of use of the area by aircraft, there would be a corresponding low (lowest) risk of an aircraft incident or skier accident. If a backcountry incident did occur (avalanche, broken leg, snow machine breakdown, etc), having fewer helicopters in the area to provide assistance, rescue and transport to a hospital could result in a slightly lower overall level of safety than if some commercial helicopters were in the area.

Effect of Alt 2, 3, and 4 (1, 2, or multiple operators) -

With as many as 8 and as few as a single helicopter (or no helicopter) operating within the region there is a range of potential exposures and affects. The greater the number of helicopters operating in the area the greater the potential may be for reducing air safety or skier safety. However, with one operator (alternative 2) or two operators (alternative 3) it is considered most likely that good communications will exist between helicopters, and safety risks will be minimal.

Permitting heli-ski activities on the National Forest will likely increase the potential for risk in the analysis incrementally dependent on the amount of activity and the number of operators under permit. The more operators and helicopters (up to eight maximum) operating on the National Forest the greater the chances will be for risk to people involved in heli-ski activities, other forest users or other aircraft within the area. As use of the area increases due to more operators (permit holders) and helicopters using the analysis area, increased risks can be expected from aircraft travel and the potential for aircraft incident, crash or fuel spill; skiing accidents, backcountry survival incidents, and avalanches.

While the potential for risk increases as the number of aircraft and operators using the area increases, required Operation and Safety Plans coupled with experienced and trained guides helps to mitigate and minimize that risk. The Forest Service requires helicopters to operate and meet all FAA standards. The Forest Service has also placed a restriction on the maximum number of helicopters (8) which may operate within the analysis area at one time per the mitigation measures listed on 20 and 21. The Forest Service will also continue to monitor and evaluate heli-ski operators for safety compliance and field conditions such as safe numbers of operating helicopters to help insure that a high standard of safety is maintained.

As the number of operators increases (up to a maximum of three or more operators in alternative 4) and the number of helicopters working in the analysis area increases (up to the maximum limit of eight) it can be expected that the hours of helicopter flight time logged will increase, air traffic congestion will increase, use of primary flight paths, passes, and flight corridors will increase, the likelihood of encountering other groups and fly-bys occurring will increase, and the potential risk for a “close call” or an aircraft accident occurring would also increase.

Because the analysis area includes a very large area (approximately 225,000 National Forest System acres) spread out between 7 (seven) regions, it is expected use by one operator (**alternative 2**, estimated 3 helicopters average) or two operators (**alternative 3**, estimated 6 helicopters average) would be largely absorbed by the size of the area and regions within which to spread out the people and use. It is also expected that communication and coordination between helicopters from two companies (permit holder) is expected to be very good, which would result in fewer fly-bys, encounters between groups, and a greater degree of dispersal between regions, and therefore a higher degree of safety for helicopters and users.

With three or more operators (**alternative 4**) the maximum constrained limit of eight helicopters working in the area at one time would be reached on a nearly continuous basis. The ability of the seven regions to safely absorb this additional use would be decreased because more helicopters would be flying in the area more frequently at any given time. Because (estimated limit of eight) helicopters from three or more companies would be competing for air space, and communication and coordination between (three or more) competing companies would be expected to be less, it is expected a higher number of fly-by's would occur, noise levels would be greater, encounters between groups would increase, and the potential for a “close call” or aircraft accident occurring would increase. Under alternative 4, due to the potential for numerous aircraft (estimated eight average) and numerous operators (three or more) and the greater potential for communication breakdown to occur, the potential for helicopter and user safety to be compromised under this alternative is considered to be greater.

Chapter 3 – Environmental Consequences

Introduction - This chapter describes the affected environment and the environmental consequences of each alternative by significant issue. It also presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2.

All effects, including direct, indirect and cumulative effects, are disclosed. Effects are quantified where possible, and qualitative discussions are included. The means which potential adverse effects will be minimized or avoided are described (see also Chapter 2, and Appendices I and II).

The discussions of resources and potential effects take advantage of existing information included in the Revised Forest Plan FEIS, other project EA's, project-specific resource reports and related information, and other sources as indicated. Where applicable, such information is briefly summarized and referenced to minimize duplication. The planning record for the this analysis documents all project-specific information, including resource reports and other results of field investigations. The record also contains information resulting from public involvement efforts. The planning record (project file) is located at the Cordova Ranger District Office in Cordova, Alaska, and is available for review during regular business hours. Information from the record is available upon request.

Analyzing Effects - Environmental consequences are the effects of implementing an alternative on the physical, biological, social and economic environment. The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) includes a number of specific categories to use for the analysis of environmental consequences. Several are applicable to this analysis of the proposed project and alternatives, and form the basis of the analysis that follows. They are explained briefly here

Direct, Indirect and Cumulative Effects - Direct environmental effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are spatially removed from the activity, but would be significant in the foreseeable future. Cumulative effects result from incremental effects of actions, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time.

Unavoidable Adverse Effects - Implementation of any action alternative would cause some adverse environmental effects that cannot be effectively mitigated or avoided. Unavoidable adverse effects often result from managing the land for one resource at the expense of the use or condition of other resources. Many adverse effects can be reduced, mitigated or avoided by limiting the extent or duration of effects. The process of identifying regions within the project analysis area available for heli-ski guided operations and determining carrying capacity was used to avoid or lessen adverse consequences. The application of Revised Forest Plan standards and guidelines, best management practices, project-specific mitigation measures, and monitoring are all intended to further limit the extent, severity, and duration of potential effects. Such measures are discussed throughout this chapter. Regardless of the use of these measures, some adverse effects may occur. The purpose of this chapter is to fully disclose these effects.

Short-term Use and Long-term Productivity - Short-term uses, and their effects, are those that occur annually or within the first few years of project implementation. Long-term productivity refers to the capability of the land and resources to continue producing goods and services long after the project has been implemented. Under the Multiple-Use Sustained-Yield Act, and the National Forest Management Act, all renewable resources are to be managed in such a way that they are available for future generations. Resources determined to be potentially affected by this use of National Forest System lands include wildlife and recreation.

Irreversible and Irretrievable Commitments - Irreversible commitments are decisions affecting non-renewable resources such as soils, wetlands, unroaded areas, and cultural resources. Such commitments are considered irreversible because the resource has deteriorated to the point that renewal can occur only over a long period of time or at a great expense, or because the resource has been destroyed or removed. Issuing or not issuing a special-use permit for helicopter guided skiing is not considered to be an irreversible commitment of non-renewable resources because of the nature of the action and the fact that the permit may or may not be renewed when it expires.

Irretrievable commitments represent opportunities foregone for the period during which resource use or production cannot be realized. Such decisions are reversible, but the opportunities foregone are irretrievable. As an example, deferring or not issuing the special-use permit at this time due to resource concerns would be an irretrievable commitment of the recreation resource otherwise obtainable. The commitment is irretrievable rather than irreversible, because future special-use permits could provide that guided recreation experience. Issuing one or more permits is not an irretrievable commitment of resources.

Environmental Consequences and Effects on the Significant Issues

Issue 1 - What is the effect of the guided heli-skiing on the recreation experience of users in the area, including noise and type of experience provided. Specifically, how would the noise from helicopter take-offs, landings, and overflights affect other users of the area and people along the flight paths?

Helicopters and Heli-skiing Effects on Noise and Type of Recreational Experience

Provided: While many user groups tolerate some noise, some cross-country skiers and many ski touring skiers are sensitive to the effect of noise that penetrates the pristine setting. Skiers that are traveling off-trail seem to be the most affected. Heli-skiers seem to be the least affected by noise.

There are two sources of noise associated with helicopter operations: the engine and the rotor blades. Valdez Heli-ski Guides (**VHSG**) uses an A-Star helicopter for its skiing operations. The A-Star is one of the quietest helicopters produced. Turbine powered helicopter engines, like an A-Star, make a sound no louder than a car or truck (USDA, Forest Service, June 1999). The actual movement of the main rotor blades is responsible for much of the sound signature of helicopters (HAI, 1993, El-Ghobasy, 1995). This modulation sound, termed "blade slap," has been identified as the most disturbing component of the noise due to its impulsive nature and because it occurs in the mid-frequency range where the human ear is most sensitive. The A-Star and other helicopters produce the most sound (blade slap) during an approach for landing. The sound would be similar to a large jet at one nautical mile. Noise levels produced by the A-Star helicopter are shown in Table 3.1, on the next page. Typical noise levels generated by other common activities are given for a comparison.

TABLE 3.1 Noise levels of the A-Star helicopter ¹, compared to other common noise levels ².

Noise Level (dBA)	Examples of Common Noises Compared to A-Star	Noise Level Experienced & dBA
130	Military jet take-off from aircraft carrier with after-burner at 50 ft. elevation	Uncomfortably Loud 110-120 dBA
103	Jet fly-over at 1,000 ft. elevation	Very Loud 80-110 dBA
100	Bell Jet-2A helicopter at 100 ft. elevation	Very Loud 80-110 dBA
97	B737 or DC-9 aircraft at 1 nautical mile before landing	Very Loud 80-110 dBA
89.3-93.5	A-Star Helicopter @ Take Off	Very Loud 80-110 dBA
91.4-94.5	A-Star Helicopter Approaching 56 knots/hour	Very Loud 80-110 dBA
87.1-92.5	A-Star Helicopter Overflight at 492 ft. elevation	Very Loud 80-110 dBA
90	Motorcycle at 25 ft. distance	Very Loud 80-110 dBA
88	Prop. plane flyover at 1,000 ft. elevation	Very Loud 80-110 dBA
84	Diesel truck traveling 40 mph at 50 ft. distance	Very Loud 80-110 dBA
83	Diesel train traveling 45 mph at 100 ft. distance	Very Loud 80-110 dBA
77	Passenger car traveling 65 mph at 25 ft. distance	Moderately Loud 60-80 dBA
73-78	Snowmobile at 50 ft. distance	Moderately Loud 60-80 dBA
60	Conversation at 60 ft. distance	Moderately Loud 60-80 dBA
50	Large transformers at 100 ft. distance	Quiet, 10-50 dBA
44	Bird calls	Quiet, 10-50 dBA
10	Whispering	Just audible, 10 dBA

¹ Sources: Aerospatiale 1990.

² Sources M.C. Branch et al. 1970

A number of factors can influence the loudness of a sound. Distance from the sound source affects the intensity. The atmosphere absorbs some of the sound. Other environmental factors that influence sound include wind, terrain, and vegetation, all of which may either reflect or absorb it (USDA, Forest Service, June 1999). A Forest Service Sound Study (USDA, Forest Service, 1994) concluded that the sound levels from helicopters do not pose a threat to hearing safety. Therefore, the only acoustic impact to people resulting from the helicopter sounds is that of annoyance to those who reside near or use areas close to helicopters flight paths.

Alternative 1 (No Action) - No action, no re-issuance of a heli-ski permit would result in the analysis area being used primarily by cross-country skiers, ski touring, private groups that use fixed-wing aircraft or private helicopters to access ski terrain, or snowmachines. The opportunity for helicopter guided skiing in the project area would be foregone. There would be less noise because no permit would be authorized in the project area for guided helicopter skiing. Unguided publics, snowmachines, and overhead flights would still occur, resulting in some noise created by helicopter and plane take-off and landings. Recreationists near Thompson Pass and Orca Cannery would hear helicopter use for those activities permitted on State and BLM lands and unguided helicopter skiers on all lands. The Forest Service does not control flight seeing or flight paths over Chugach National Forest System lands; the Federal Aviation Administration (FAA) has that jurisdiction. A private group of individuals can rent a helicopter or fixed-wing aircraft and ski the Chugach National Forest without a permit. However, while no figures are available for such use, it is believed that such use is very low. Other noise, such as road traffic, avalanche control, and snowmobiles, would continue.

Because no commercial heli-skiing helicopters would be using the area under this alternative, overall use by helicopters and noise from commercial helicopters would be very low. As a result, the Primitive II ROS recreational experience (see Table 1.1) including a high degree of solitude, low number of encounters between groups, and a “primitive” experience by recreational users of the area, would be highly met.

Alternatives 2, 3, and 4 - Depending upon which operator(s) obtain the special use permit(s) to provide guided helicopter skiing, the flights could be based out of Thompson Pass, Valdez airport or the Orca Adventure Lodge near Cordova. Flight paths to access the analysis area would be through Thompson Pass and/or Marshall Pass coming from Valdez, or the Rude River drainage coming from Cordova. One helicopter typically services five to ten people per day (including guides). A typical helicopter load using an A-Star is five people. Depending on weather conditions, skiing locations, and length of time services are provided, the number of helicopter landing and take-offs will vary. A typical average full day of skiing for one helicopter from Thompson Pass would service 10 people (two groups of 5), accessing the closest regions; 1, 2, 3, or 4 of the analysis area.

Most heli-ski companies use the A-star helicopter which has about a 2 hour flight capacity with a partial load of fuel and five passengers. The helicopter would shuttle the two groups of skiers and guides from the starting location to the first ski area; refuel at the starting location on the second load; transport skiers to 8-10 runs per day; ferry groups between the drop off and pick up zones for each run and refuel twice during the day at either a fuel cache or the starting location before returning each group to the base location at the end of the day. If the operator skied eight runs in a day and visited the fuel cache twice the helicopter would land and take-off within the ski area approximately 58 times in any given

day. Some days could be more or less depending on the number of groups requiring transport, number of runs skied and local conditions.

Since the majority of landing and departure zones are not near Valdez or Cordova and since flight paths do not take them over residential areas, it is not anticipated that Valdez or Cordova residents would be affected by noise associated with helicopter landings and departures. Helicopters flights over remote areas within the analysis area would occur including approximately 59 take-offs and landings per day, per helicopter and could affect National Forest, State, BLM and private land users. For each helicopter working within the ski area, most flights would be of short duration between the top and bottom of runs and occur primarily in 1 or 2 ski regions so that helicopter and skier efficiency could be maximized (ie to get the most out of the day). It is estimated noise from these flights may be audible for 3 - 5 minutes. It is calculated that 59 landings and take-offs within the ski area over a maximum possible period of 9 hours equals approximately one landing/take-off every 9.1 minutes. This would mean that during the course of the day a single helicopter would be in the air approximately 50% of the time.

As numbers of helicopters and operators increase (to a maximum of eight helicopters) so does the amount of time helicopters are in the air and the amount of potential impact to all seven regions and all users of the area. Potentially eight helicopters could be in the air in all regions of the ski area nearly the entire day. As helicopters approach, pass over people along flight paths and continue on, it is estimated that the noise would be audible for 2 - 4 minutes. While the actual amount of time that one hears each helicopter is not long, the cumulative disturbance associated with up to eight helicopters operating in the seven regions could result in noise levels of various decibel levels occurring throughout most of each operating day. Other users in the area could be impacted by helicopter noise throughout the day. Mitigation measures (per page 20) to help reduce the impact of helicopter noise will be included in any heli-ski permit issued for the area.

All alternatives allow for a maximum of eight helicopters and 87 persons at one time (PAOTs) for 89 service days or 7,743 client days mathematically possible annually. Realistically however, a single operator would likely average 2-4 helicopters (estimated average of 3) at a time. Two operators would use approximately 4-8 helicopters (estimated average of 6) at a time and 3 or more operators would be constrained to the maximum limit of eight helicopters (refer to Comparison of Alternatives "Introduction" for the average number of helicopters per operator/holder assumptions).

As the number of heli-ski operators increases in the area from alternative 2 (single operator) to alternative 3 (two operators) to alternative 4 (three or more operators), the type of recreational experience provided to heli-ski and non-heli-ski users of the area will change. The desired ROS setting prescribed for this area in the Revised Forest Plan is Primitive II (primitive-motorized). The type of recreational experience expected by users of this area (see Table 1.1 Recreational Opportunity Spectrum Class Characteristics) under a PII ROS class are for a high degree of solitude, a very low expectation of encountering other groups (expected one or less parties per day), a very high degree of risk and challenge, and a maximum party size of 15.

As the number of operators and helicopters working in the area increases it can be expected

that the degree of solitude for users will decrease, the likelihood of encountering groups will increase, and the “primitive” characteristics which people would be looking for in using this area would decrease. Because the analysis area includes a very large area (approximately 225,000 National Forest System acres) spread out between 7 (seven) regions, it is expected use by one operator (**alternative 2**, estimated 3 helicopters average) or two operators (**alternative 3**, estimated 6 helicopters average) would be largely absorbed by the size of the area and regions within which to spread out the people and use. It is also expected that communication and coordination between helicopters from two companies (permit holders) is expected to be very good, which would result in fewer fly-bys, encounters between groups, and a greater degree of dispersal between regions.

If three or more operators (**alternative 4**, maximum constrained limit of eight helicopters) were operating in the area nearly continuously on good operating days, the ability of the area and seven regions to absorb this additional use would be decreased. Also, because (estimated eight) helicopters from three or more companies would be competing for air space, and communication and coordination between (three or more) competing companies would be expected to be less, it is expected a higher number of fly-by’s would occur, noise levels would be greater, encounters between groups would increase, and the feeling of solitude and of being in a pristine, primitive setting would be diminished.

It can be assumed that bad weather or unforeseen problems will occur which will preclude use of all or a portion of the analysis area from use a certain percentage of days each operating season. In 2002, VHSG operated for the months of March and April (61 days) with 704 client days. Of the 61 days, they were unable to fly 25 days (41%) due to weather or other reasons. This amount of use is well within limits identified in this analysis and is considered low-use for the overall analysis area (all seven regions combined).

Cumulative Effects of Issue 1-

Cumulative Effects of Noise and Recreation Experience: Since guided heli-skiing is limited to the winter season (February 1 to April 30), there would be no cumulative effects of noise during other seasons. The cumulative effects of noise would be most pronounced at the staging areas at the Valdez airport, the flight path through Thompson and Marshall Passes, the Rude River corridor and the permit (analysis) area. Increased numbers of operators would result in more noise, incrementally, as more operators and helicopters were added up to the point at which the upper limit of eight helicopters is reached.

While the actual amount of time that one hears each helicopter is not long (estimated 2-4 minutes), the cumulative disturbance associated with up to eight helicopters operating in the seven regions could result in noise levels of various decibel levels occurring throughout most of each operating day. As the number of operators and helicopters working in the area increases it can be expected that the degree of solitude for users will decrease, the likelihood of encountering groups will increase, and the “primitive” characteristics which people would be looking for in using this area would decrease. Other users in the area may be impacted by helicopter noise as well, but it is expected the amount of disturbance is likely to be minimal because there is likely to be very few people around using the area at this time of the year. Helicopter noise would be reduced by implementing mitigation measures identified on page 20 which would be incorporated into any heli-ski permit issued.

In most of the ski zones there is currently little background noise, except for an occasional snow machine or other aircraft. Helicopter noise will add to the current existing low levels of noise in the analysis area during this time of the year.

Comments were received concerning the amount of noise in the Thompson Pass area due to helicopters. However, most lands surrounding Thompson Pass are administered by the State of Alaska and the BLM. The Bureau of Land Management who also manages lands north of the analysis area is also currently involved with developing an Environmental Assessment to determine how much heli-ski use to allow. With the inclusion of National Forest System lands and BLM lands in addition to State lands available for heli-skiing it is very likely that overall use and subsequent noise levels will likely decrease in the Thompson Pass area because there will be less local shuttling of clients within the pass and more activity on National Forest System lands and BLM lands.

If helicopter operations are based out of Orca Adventure Lodge the use and subsequent helicopter noise would be additive to existing low level noise which consists of private aircraft, boats and jets along the flight path over Nelson Bay and the Rude River corridor. Most helicopter activity however would occur within the permitted heli-ski area and cumulative noise in other locations would be minimal.

Helicopters take skiers to remote areas, spread out the use, and provide access to skiing that may not be otherwise available. However, helicopters may also disturb and/or displace other winter recreation users such as cross-country skiers and ski touring users. There is a concern from some individuals that over time, increasing numbers of helicopter skiers could be taken to the Tasnuna-Cleave Creek watersheds. Once helicopter skiers use an area, the attractiveness to cross-country skiers can decrease. Tour ski operators may find the area attractive for guiding or personal enjoyment due to its remoteness, isolation, and lack of other users. This area is currently not used by many un-assisted backcountry skiers. Some snow machine operators do traverse Marshall Pass and continue down to the Copper River to Cordova or Chitina and vice-versa.

While noise from winter helicopter skiing operation does not add to noise during other seasons, the existing noise level in the summer is likely higher in the Thompson Pass Area. Use of the Richardson Highway June through September increases dramatically with the summer tourist season. The sound of vehicle tires on pavement during peak daylight hours is regular. Flight seeing and glacier viewing and charter fishing replace helicopter and fixed-wing skiing. There are nine operators listed in the Valdez and Cordova phone book who conduct flight-seeing tours over the Chugach Mountain Range. ORVs and ATVs replace snowmobiles, but the amount of use is less. Hikers replace cross-country skiers. Campers use the campgrounds along the Highway.

While it is impossible to predict new levels of noise in the future, one can speculate that development and activities will continue to grow. With this growth, noise in the winter would increase. As the snowmobile industry continues to improve the capabilities of their machines, more country would likely be affected by their use. One can also expect that use of helicopters and fixed-wing aircraft for private skiing and new applications for guided skiing in the area would likely increase over time. Other uses such as ski-touring and dog sledding will likely increase as well. With increasing winter use of the area from all sources, the potential for associated avalanche incidents resulting from this use also increases. With

the increased demand for the land potential conflict between user groups is also likely to increase.

Currently user conflict within the Thompson Pass area is well documented on state lands and has been an issue with the BLM heli-ski EA currently being developed. The agencies are working on ways to reduce these conflicts. To date use on the National Forest has been very low; well below the carrying capacity for the area. Because the Forest Service will continue to assign limiting capacities to any commercial operator under permit use will remain low and below the carrying capacity.

Cumulative Effects on Roadless Areas – There would be no cumulative effects on roadless areas and their potential for wilderness classification because there would be no activities which would alter the physical setting or degrade wilderness values.

Issue 2 - What impacts will guided heli-skiing have on the wildlife habitat and populations in the area? How would helicopter noise and the visual presence of helicopters affect wildlife, especially mountain goats?

The wildlife species considered in this analysis are those that have been identified through scoping and responses to other similar proposals. Species include: brown bear, black bear, moose, mountain goat, wolves, lynx, wolverine and forest raptors (bald eagle, goshawk, great horned owl, and great gray owl). Mountain goats are considered as the management indicator species in the Revised Forest Plan. This project would have no effect upon any federally listed threatened, endangered or sensitive species (see Biological Evaluation, Appendix II).

Before getting into a discussion of the potential impacts to specific wildlife species, the following provides some background on the scientific community's current understanding of the effects of overflights on wildlife in general.

Effects of Helicopters and Heli-skiing on Wildlife--In general, wildlife responds to low-altitude (300-800 feet) aircraft overflights (USDI, 1994). The manner in which they do so depends upon life history characteristics of the species, characteristics of the aircraft, flight activities, and a variety of other variables and factors such as season, location, habitat type, species, and previous exposure to aircraft. Over 200 published and unpublished reports may be found on the subject. Review of the literature shows that aircraft overflights may cause flushing of birds from feeding or nesting areas, alteration of movement or activity patterns, decreased foraging efficiency, panic running of big game animals, decreased young survival, and increased heart rates in big game animals.

Of primary concern is the change in behavior or physiological responses to the overflights and the animals' fitness or ability to survive. Some researchers believe that low-elevation overflights can cause excessive arousal and alertness or stress (Fletcher, 1980, 1990). If chronic, stress can compromise the general health of animals. The way animals respond to overflights could interfere with raising young, habitat use, and physiological energy budgets. Alteration in physiological energy budgets have been repeatedly documented for several species, as well as individual and group behavioral responses. Few studies, however, have addressed long term or indirect consequences of such disturbance. Such consequences may or may not occur and may be detectable only through long-term studies (USDI, 1994). The list below summarizes the specific actions that cause wildlife impacts and factors that affect the impacts:

- Human activity, numbers, noise, and movements from access areas when passengers are at the access area.
- Helicopter fly by or fly over.
- Helicopter landings and take-offs (including the take-off sequence).
- Approach and take-off patterns (to and from landings).
- Hovering.
- Sitting with engine operating on-the-ground.
- Varying levels and types of sounds created by blade pitch.
- Different noise levels associated with cruising, landing, and flying in head and tail winds.
- Elevation and distance of helicopters from the organism reacting to it.

Indirect effects on wildlife such as accidental injury, energy losses and impacts to offspring survival have also been documented. Current literature supports the argument that aircraft overflights may negatively impact wildlife populations. However, the overall significance of such impacts is not clear. There is no consensus in public or scientific communities regarding impact definition.

For this analysis, the following criteria are used to categorize impacts to wildlife from helicopter access and associated recreational activities. These criteria are found in a 1994 Report to Congress, Report on effects of aircraft overflights on the National Park System (USDI, 1994). According to the National Park Service (NPS), these criteria are meant to help agencies in determining the severity of impacts. In these definitions, "species of concern?" include Federally- or State-listed threatened, endangered and candidate species, species of local economic importance, or species of particular concern to conservation or other interest groups. This definition can be expanded to include any species that is known to be susceptible to disturbance. "Habitat" refers to the physical landscape and its ecosystem components that are subjected to overflights. The criteria are summarized below.

Negligible effects

- No species of concern are present, no/minor impacts expected.
- Minor impacts that do occur have no secondary (long-term or population) effects.

Low Impacts

- Non-breeders of concern present in low numbers.
- Habitat is not critical for survival; not limited to the area targeted for overflights, etc.
- No serious concerns expressed by State or Federal fish and wildlife officials.

Moderate Impacts

- Breeding animals of concern are present/present for critical life stages.
- Mortality/interference with activities necessary for survival likely to occur occasionally.
- Mortality/interference are not expected to threaten the continued existence of species in the area.
- State and Federal officials express some concern.

High Impacts

- Breeding animals present in high numbers and/or during critical life stages.
- Overflight areas have history of use during critical life stages during critical periods.
- Habitat is limited and animals cannot relocate to avoid impacts.
- Mortality or other effects (injury, physiological stress, effects on reproduction and young raising) are expected on a regular basis; these effects threaten the continued survival of the species.
- State or federal officials express serious concern.

Using this evaluation process relies on the professional opinions and best judgments of wildlife managers and researchers. The level of impact listed here is used to "trigger" actions to eliminate or reduce such impacts. In general, the Forest Service regards situations consistent with "low impacts" to warrant monitoring, while situations that represent "moderate impacts" or "high impacts" would require some type of mitigation. These categories are used to identify the expected impacts to the wildlife discussed in the next section. The review of available literature forms the basis for mitigation measures.

Potential Impacts to Focus Wildlife Species

Bears - Brown and black bears are usually found in dens until late winter or early spring and would not normally be seen during the heli-skiing season. They may occasionally be found foraging in lower elevation habitats during the late winter or early spring. Bears generally den below the vegetation line and would be out of the paths of skiers and away from drop-off areas. A small potential for disturbance exists during overflights and passenger pick-up. Heli-ski operator maps show that all runs within the analysis area terminate on glaciers where pick-ups will occur. This situation keeps the helicopters from landing near most denning habitat. If a den occurs near the lower edge of the vegetation boundary on a ski run, disturbance may occur during pick-up operations. If a bear was disturbed and left its den, it would either return to its den after the disturbance or relocate. Repeated disturbance would probably lead to den relocation and the associated energy expenditure resulting from that effort. Effects on survival and productivity of this are unknown but are probably minimal.

Dens by their nature are well insulated, and therefore are insulated from sound. Because of the potential for goat disturbance, helicopters will be flying at 1500 feet above the ground during transport in and out of the area. This should keep ground-level noise to a minimum. Overflights will probably not have a noticeable effect on denning bears. We have found no studies that show effects of helicopter overflights. Such data in the future could lead to a changing of flight paths. Potential impacts to bears for all alternatives are characterized as "low".

Moose - Moose may be present within the analysis area. Low elevation mixed forest and shrubby habitats would be of the highest importance as moose winter range. Most of the area used for skiing is not used by moose because moose typically concentrate at lower elevations. Seasonal movements of the animals in this area are unknown, but they would likely be in the river valleys or move out toward the coast during winter. The most likely moose encounters would be flights over the Tasnuna River valley. For all alternatives, helicopters will maintain a 1,500 foot elevation during flights in and out of the area, resulting in minimal impact. Potential impacts to moose for all alternatives are characterized as "negligible to low".

Lynx - Lynx occur in the project area in relatively low numbers. They would most frequently be found in coniferous forest habitat types. Lynx are largely nocturnal, so their activity time would not coincide with heli-ski activities. They would be expected to seek cover if disturbed by a helicopter or skier. Disturbance would be expected to be short term. Potential impacts for all alternatives are characterized as "negligible to low".

Wolves - Wolves occur throughout the analysis area, also in relatively low numbers. Their presence and abundance is related closely to the presence of prey in an area. They would use all habitat types with the exception of lakes. If disturbed by a helicopter or skier wolves would be expected to move away from the disturbance and seek cover. Wolves breed in early spring, and we have no information on potential den sites in the area. Wolves are able to breed, however, in areas of high air traffic. Potential impacts to wolves for all alternatives are characterized as "negligible to low".

Wolverines - Wolverines occur in the analysis area in low numbers. They are found in any habitat where sufficient carrion and prey occurs and use all habitat types with the exception of lakes. Wolverines remain active throughout the winter and move long distances to forage. Studies show a tendency for wolverines to forage in lower elevations during the winter months. Disturbance of foraging animals would mainly be due to helicopter overflights. Because the flights in and out of the area will occur at 1,500 feet elevation, this disturbance will be slight. Some disturbance may occur if a wolverine is encountered during take-off and landing. In the event of a disturbance, the animal will probably move away and seek cover and then continue foraging after the disturbance event.

Unlike foraging, denning occurs most often in alpine areas. Denning occurs in late winter through early spring, during which time wolverines seek to avoid disturbance. Denning wolverines are sensitive to human disturbance, and human presence in an area can lead to relocation of the den site. Little is known about wolverine distribution, and the potential for den disturbance is unknown. However, because of low wolverine density, chances of encounter are probably low. If an encounter does occur during denning, relocation of the den site will likely occur. Little is known about wolverine energetics, and the overall effects of den relocation is unknown. Given a wolverine's ability and propensity to travel long distances on a daily basis however, the energy expenditure required for relocation is not likely to affect overall survival. Potential impacts for all alternatives are characterized as "low".

Raptors - Habitat for raptors is generally near the toe of slopes or in valley bottoms. Other than helicopter overflights, most areas of activity (runs and landing areas) occur outside of this habitat. Raptors may begin early nesting prior to the end of the helicopter skiing season. A relatively large amount of potential nesting habitat within the project area is available that would not be affected by helicopter skiing activities.

Bald eagles are most likely to be found in the analysis area at low elevations near streams and rivers away from landing areas and well below the required flight elevation. Most eagles will likely migrate out during the winter to feed closer to the coast. They will begin to move back into the area in late April to early May. Depending on how close they are approached by a helicopter or skier, they may remain perched in a tree, or they may flush. Potential impacts for all alternatives are characterized as "negligible to low".

Goshawks are unlikely to be found in significant numbers in the analysis area during the operating season. Food resources will be scarce during winter months, and like bald eagles, and

goshawks would probably migrate out of the area in search of food. If disturbed by a helicopter or skier they would likely fly into the forest. Such disturbances would be short term. Potential impacts for all alternatives are characterized as "negligible to low".

Great horned and boreal owl numbers are also low in the analysis area during the operating season. These birds nest and perch in timbered areas, and most of the skiing will take place in treeless chutes. Boreal owls are early nesters and can return to their nesting areas as soon as March or April. However, these birds are generally nocturnal and their major activity times will not coincide with heli-ski activities. Heli-ski activities are not expected to affect the food base of these birds. Helicopter noise may cause these birds to fly away from the disturbance, but they would be expected to resume normal behavior after the disturbance event. Potential impacts for these species for all alternatives are characterized as "negligible to low."

Other Bird Species – The U.S. Fish and Wildlife Service published a list of Species of Management Concern for non-game migratory birds (USDI, Fish and Wildlife Service 1995). In addition the Boreal Partners in Flight Working Group published the Partner’s in Flight Alaska Biogeographic Regions Landbird Conservation Plan (Boreal Partners in Flight Working Group 1999). When these lists are cross-referenced with birds known or likely to occur in the area, the following species of concern are identified:

Table 3.2 - Other bird species likely to occur within the analysis area

Species		Habitat
Alder flycatcher	<i>Empidonax alnorum</i>	Alder thickets
Blackpoll warbler	<i>Dendroica striata</i>	Conifers, primarily spruce
Chestnut-backed chickadee	<i>Parus rufescens</i>	Conifers, mixed forests
Golden-crowned sparrow	<i>Zonotrichia atricapilla</i>	Thickets, shrubs, dwarf conifers
Gray-cheeked thrush	<i>Catharus minimus</i>	Riparian thickets, coniferous forest edges
Northern shrike	<i>Lanius excubitor</i>	Deciduous, coniferous trees, thickets
Olive-sided flycatcher	<i>Contopus cooperi</i>	Conifers, bogs
Rufous hummingbird	<i>Selasphorus rufus</i>	Conifers, brush, adjacent meadows
Townsend’s warbler	<i>Dendroica townsendi</i>	Conifers, mixed forests
Varied thrush	<i>Ixoreus naevius</i>	Coniferous, deciduous forests with dense understory

With the exception of chestnut-backed chickadee, all of these species are migratory and would not be present in the analysis area during the winter months. Most migratory passerines arrive in this area during the first two weeks in May. There may be overlap during this time period with heli-skiing activity if the heli-skiing season is extended into May, however all of these birds tend to establish first in lower elevations where water has opened and snow has begun to melt. If they move into the higher elevations, it is likely to occur later in the spring. In addition, all of these birds prefer shrubby or forested habitat, and will generally avoid the alpine areas where much of the helicopter activity will take place. Varied thrushes are known to winter in small numbers in the Gulf Coast region, but they are normally found only near the coast and open water (Isleib and Kessel 1973) and will probably not winter in the analysis area.

Chestnut-backed chickadees are common residents in the North Gulf Coast region. Their distribution as far inland as the Tasnuna Valley is unknown, but they are likely to occur there during

the heli-ski season. Most birds will likely be found in the lower valley away from heli-ski activity. They feed in coniferous and shrubby vegetation and will tend to avoid alpine areas. If disturbed the birds will probably ignore the disturbance or move to other feeding areas. Effects of helicopter disturbance on this species are probably “negligible to low”.

Mountain Goats –This section describes: 1) the existing mountain goat situation, 2) mountain goat population and trends, 3) the effects of helicopters and heli-skiing on mountain goats, and 4) the disturbance to mountain goats during the heli-skiing season.

Existing Mountain Goat Situation - Mountain goats are found throughout the analysis area. The area falls within portions of Alaska Department of Fish and Game (ADF&G) Game Management Unit 13C. Few historical surveys have been conducted in this area. The U.S. Forest Service conducted a fall survey to assess goat habitat in 2001 and conducted a winter survey in February 2002. Additional winter surveys will be conducted in 2003, and areas open to skiing may be altered as new data is collected. The Winter Mountain Goat Habitat map shown on 17 illustrates the areas that have either documented winter goat use or show strong evidence of winter goat use. These areas are to be avoided as outlined in the mitigation measures listed on page 19.

Mountain goats occur in steep and broken mountain ranges of northwestern North America from central Colorado to Southcentral Alaska. In Southcentral Alaska they occur throughout the Kenai and Chugach Mountains. Goats are most abundant in the highly glaciated coastal mountains and least abundant along the relatively dry west slope and interior portions of the Kenai Mountain range where they coexist with Dall sheep (Del Frate, 1994). Behavioral strategies of mountain goats to avoid predators primarily dictates habitat use. Cliffs and steep, broken ground are characterized as escape terrain, and this habitat is used to escape from predators. The need for escape terrain in close proximity to food resources is a critical factor in habitat selection.

Mountain goats are both grazing and browsing animals, depending on the particular habitat and season of the year. Goats have demonstrated a preference for shrub communities associated with south facing avalanche slopes during the early spring (Schoen and Kirchoff, 1982). As snow melts during the summer, goats move to higher elevation subalpine and alpine areas to feed on plants emerging from melting snow banks.

Mountain goats are typically found in small groups except during the kidding season. Kidding occurs from mid-May through mid-June. During the kidding season, pregnant females seek out isolated and secure pockets of good habitat to have their kids. The kidding areas are typically found in alpine or sub-alpine habitat. Here the female and kid remain from four to six weeks following birth as the newborn kid gains strength and coordination.

During the winter, mountain goat habitat includes forest, and windswept alpine ridges and cliff faces blown free of snow. The quantity and quality of winter habitat is thought to be the most limiting factor for mountain goats in Southeast Alaska (Suring et al. 1992). The environmental characteristics that are thought to influence habitat suitability and capability have been described by Suring et al. (1992) and are summarized as follows:

Cliffs. Cliffs must be present for an area to be used by mountain goats. Cliffs are defined as slopes greater than 65%. The areas within 1,300 feet (¼ mile) of cliffs have the highest value to goats. Habitat value diminishes further from the cliffs up to 2,600 feet (1/2-mile).

Location. Habitat use by mountain goats varies between northern and southern Southeast and Southcentral Alaska. Non-forested alpine habitats in the drier (northern interior forest) have higher value than in the wetter (southern marine-influenced rainforest) parts because the northern forests have alpine ridges blown free of snow and are available for use.

Aspect. South aspects have the highest value, north aspects the lowest value and east and west aspects have intermediate values as habitat. Snow is deeper and persists longer on northern exposures. Southern aspects receive the highest amount of radiation from the sun, have the lowest snow depths and are snow covered for the shortest period.

Mountain goats are known to be sensitive to human disturbance, and in particular to helicopters (Alaska Department of Fish and Game, 1998a). Stress from helicopter activity may displace individuals from their traditional range, and affect their overall health. Though mountain goats are believed to be sensitive to human disturbance (Joslin, 1986), few attempts have been made to record their responses to helicopter overflights systematically (Foster and RaHS, 1983). A study by Cote' (1996) noted that mountain goats appeared to be more sensitive to helicopter traffic than other open-terrain ungulates and that special care should be taken in management of this species.

Research has shown that human disturbance can displace mountain goats from previously used habitat. One study in Glacier National Park in Montana demonstrated some habituation to noise and human disturbance; however loud construction activities caused mountain goats to restrict their use of previously used areas (USDA, Forest Service, 1995, cites as Singer, 1975). Foster and RaHS (1983) found that goats in northwestern British Columbia did not habituate to regular helicopter traffic. The magnitude of their stress reactions remained constant throughout the duration of the study.

Disturbance research on other wild ungulate species supports these findings (Cote', 1996, cited as Miller and Gunn, 1980; Bleich et al. 1990). Most studies show an inverse relationship between the intensity of responses and altitude of the helicopters above the animals (Cote', 1996). The goats studied by Foster and RaHS (1983) displayed various stress reactions when helicopters came within distances of 400 meters to 1,500 meters. These reactions included disruption of feeding and flight to refuge terrain. The effects of disturbance can vary due to several factors such as the season, age and sex of mountain goats, and the distance between helicopter and goats. In a study in Southeast Alaska, adults with kids showed more pronounced reactions to survey aircraft than did adults without kids (Ballard, 1975). In Montana, all goats observed from a helicopter ran to take refuge in a crevice or under a tree (Chadwick, 1973). This type of response to escape to safer terrain may result in injury or mortality from falls. Benzon (personal communication, 1998) believes that such injuries would be more likely to occur during winter months because of increased snow and ice covering mountain slopes. Prolonged and repeated disturbance can result in a change in regular activity patterns. A disruption of normal feeding patterns may reduce foraging efficiency. A study of bighorn sheep in Grand Canyon National Park showed that helicopters at low altitudes caused a notable reduction in foraging efficiency (USDA, Forest Service, 1995, cited as Stockwell, et al., 1991). Reduced foraging efficiency affects physiological condition, which may affect survival or reproductive success. Disturbance-induced displacement from preferred terrain also has the potential to increase vulnerability to predation. Mountain goats are especially vulnerable to disturbance during the kidding period, from mid-May through mid-June (Alaska Department of Fish and Game, 1998a). Currently a study is being conducted on the Chugach National Forest to determine reaction distances to helicopters.

Studies have shown that mountain goats spend 60% of daylight hours within or at the edge of escape terrain in summer (USDA, Forest Service, 1995, cited as Fox, 1983; Schoen & Kirchoff, 1982; Smith, 1985). Near Juneau, mountain goats predominantly use rock outcrops, alpine tundra, subalpine forest, and shrub land habitat types during summer (USDA, Forest Service, 1995, cites as Schoen and Kirchoff, 1982). A study in southeast Alaska showed that 95% of all relocations of radio-collared mountain goats were within 1,300 feet of cliffs that could be used as escape terrain (USDA, Forest Service, 1995, cited as Smith, 1985).

Mountain goat home ranges are relatively small. A study in Southeast Alaska showed that home ranges are usually from 10 to 20 square kilometers (3.9 – 7.8 sq. mi.) (USDA, Forest Service, 1995, cited as Fox, et al., 1989). Seasonal range attachment to sites is high, and preferred sites are used in successive years (USDA Forest Service, 1995). Steep, rugged terrain is generally the preferred habitat. Rugged terrain aids goats in escaping from predation.

Mountain Goat Population Status and Trend - Mountain goats are found throughout the project area. The area includes portions of Alaska Department of Fish and Game (ADF&G) Game Management Unit 13C. Few historical surveys have been conducted in this area. The USDA Forest Service conducted a fall survey to assess goat habitat in 2001 and conducted a winter survey in February 2002. Additional winter surveys will be conducted in 2003, and areas open to skiing may be altered as new data is collected. The Winter Mountain Goat Habitat map shown on page 18 illustrates the areas that have either documented winter goat use or show strong evidence of winter goat use. These areas are to be avoided as outlined in the mitigation measures listed on page 21.

To avoid disturbance to mountain goats we have restricted helicopters in areas with the potential for goat encounters by creating buffer areas around goat habitat. We initially asked heli-ski operators for potential ski runs and then surveyed the areas around those runs in fall and winter. Areas not identified as potential ski runs were not surveyed and will be restricted from heli-ski activities. For the fall survey, areas with good forage and nearby escape cover were considered “goat habitat”. These areas were then checked in winter. Areas that contained goat tracks in winter or that had exposed forage and escape cover were considered “goat habitat”.

Cote' (1996) recommended establishing a buffer zone of 2 kilometers (1.24 mi.) around alpine areas and cliffs known to support mountain goat populations, and that aerial traffic be directed away from goat alpine habitat to minimize disturbance. Foster and Rahe (1983) also came to this conclusion. Benzou (personal communication, 1998) believes that helicopters less than 1,000 meters (approx .6 mi.) away from goats would cause high stress reactions. Others have suggested maintaining distances anywhere between 300 meters to 2 kilometers (.19 – 1.24 mi) from goat habitats and observed goats (Cote', 1996, USDA, Forest Service, 1995, cited as Fox et al.; Alaska Department of Fish & Game, 1998a).

Comparing Cote's work with the analysis area reveals the following differences: His work involved a 21-square-kilometer (8.1 sq. mi or 5,184 acres) study area with 109 goats. The analysis area is approximately 300,000 acres. The study area was characterized as having rolling terrain and few cliff areas. He conducted his observations from 200 meters to 700 meters from the animals as he flew by them. The density of animals is much higher than the analysis area, there were fewer escape areas for the animals to move into when disturbed by the helicopters, and on-ground observers could have had an additive effect to the overflights. Cote'

recommended a 2-kilometer buffer (1.24 mi.) for his study area to reduce impacts to goats. These recommendations may be conservative for our analysis area, given its rugged topography and availability of escape cover.

The revised Forest Plan calls for a 1,500-foot vertical distance for overflights of observed mountain goats or Dall sheep, a ½-mile landing distance from observed mountain goats or Dall sheep for take-offs and landings, and flight paths which avoid mountain goats and their habitats as much as possible. Currently the Forest Service is conducting a helicopter disturbance study to determine threshold distances for disturbance. When the results of these studies have been determined, buffer distances may be altered. Until that time, permit holders will be required to operate under the restrictions of the Revised Forest Plan.

Mitigating potential effects on foraging was evaluated. Landings outside of the morning and evening foraging periods can reduce impacts to foraging efficiency (Foster and Rahe 1983). It is not known if such restrictions would minimize disturbance to goats that are likely to be foraging throughout the entire day during the winter months (Seaburg 1998). However, due to the short operating season and the exclusion of goat foraging areas in the mitigation measures, daily operating period restrictions may not have a significant benefit for the mountain goats.

The Effects of the Alternatives on Mountain Goats—This discussion of the effects of reflects incorporation of mitigation measures into the alternatives. Helicopter landings on snow or ice do not directly modify or change mountain goat habitat. Therefore, effects are limited to disturbance.

Alternative 1 (No Action—i.e., no permits issued) - there would be fewer environmental consequences from helicopter noise or visual presence than for the other alternatives. The Forest Service does not control flight seeing or flight paths over the Chugach National Forest, however, and private groups of individuals could still rent a helicopter or fixed-wing aircraft and ski the area without a permit. Mountain goats could still be impacted by this use.

Alternatives 2, 3, and 4 - will all have similar impacts on mountain goats. All alternatives will have the same limit on the number of helicopters allowed per day. In addition, all alternatives will be restricted by the same mitigation measures. Because Alternative 2 allows only a single operator, however, the chances of reaching the upper limit of use is less than in Alternative 3 or Alternative 4. Therefore we would expect fewer potential disturbance events under Alternative 2 than under Alternative 3 than under alternative 4.

Alternative 4 - we would expect to reach the upper limit of helicopter use (eight helicopters) on most skiable days. This situation could create the maximum amount of wildlife disturbance. However, because of the mitigation measures under this permit, this amount of use should only cause minimal disturbance.

Summary of Direct and Indirect Effects on Wildlife - All of the impacts to wildlife due to the commercially guided helicopter skiing proposal would be characterized as indirect effects. No long-term habitat alteration would occur. The indirect impacts such as disturbance and displacement would be short term and of limited duration, as discussed above. These impacts are not likely to cause long-term population impacts to any of the wildlife typically found in the area.

Cumulative Effects of Issue 2

For most wildlife species, the cumulative effects area is restricted to the analysis area. Some species may travel out of the analysis area during the winter months and be subject to other recreational disturbance. This analysis examines how other winter activities, along with the guided heli-ski proposal, would affect the identified wildlife species. Summer wildlife habitat covers a much greater area and animals are not subjected to energy stress like they are in the winter. Therefore, this cumulative analysis is limited to the winter heli-skiing season. No species is subjected to any year-long effects by the proposed heli-skiing or helicopters.

In general, the analysis area and the surrounding area are very remote, and winter use is low. The major winter activity to consider for cumulative effects is snow machine use. The amount of snow machine activity within this area is unknown but it is believed to be very low. The aerial survey done in February of 2002 showed some use in the Marshall Pass area and the Tasnuna River Valley. Although not currently intense, snow machine pressure is likely to increase in future years.

All focus species are currently subject to winter overflights by aircraft, but because of its remote location, winter air traffic is very low. There does not appear to be any cumulative effects from aircraft overflights. All mammalian species discussed, with the exception of raptors, are commonly hunted or trapped.

Black and brown bears are found throughout the area. As described earlier, heli-skiing activities would be generally away from likely denning areas. Snow machines may use the Tasnuna River valley, which contains more likely denning habitat. Dens by their nature are well insulated, however, and therefore insulated from sound. There is a remote chance that a winter recreationist, such as a heli-skier or snowmobiler could disturb a denning brown or black bear. Generally when this happens, the bear either returns to its den or finds a new den. Repeated disturbance would probably lead to den relocation and the associated energy expenditure resulting from that effort. On very rare occasions, a bear will be seen in the middle of winter. It is not known why such bears leave the den. After a short stay, the bear returns to a den. If a bear emerges from a den early in the spring, it usually moves to a major food source at lower elevations. In these areas, while there would be less chance of helicopter overflight, there could be more conflict with snow machine riders. While we don't expect heli-skiing to add significantly to cumulative effects, if a bear were disturbed by a snow machine activity it could be further disturbed by the presence of a helicopter. Such instances would be very rare. It is unlikely that heli-skiing would have a significant additive impact on bears.

Moose are found throughout the Tasnuna River valley. This is also the area where snow machine operators are most likely to go. Snow machines have the greatest potential to disturb moose because of their noise and their ability to travel rapidly over snow. If moose are not harassed, they can usually move away from the disturbance. However, they would use up some of their energy reserves. If this happens regularly throughout the winter, moose can become weakened and are more susceptible to predators. Moose are killed in the winter by predators, such as wolves and occasionally by wolverines. At present, snow machine use is not high enough to warrant concern. However, if snow machine use increases, issues may develop.

It is unlikely that heli-skiing would have significant additive impact on moose. The areas where we would expect to find moose would not be used for heli-skiing, and for all alternatives helicopters will maintain a 1,500-foot elevation during flights in and out of the area. It is

possible that individual moose disturbed by snow machines could be further disturbed by a helicopter overflight. Such a disturbance would be minor and short-lived.

Lynx - Lynx occur in the analysis area in relatively low numbers. They would most frequently be found in coniferous forest habitat types. Lynx are generally nocturnal, and their highest activity time would be outside of heli-ski activities. If they are disturbed, by a helicopter, snow machine, or skier, they would be expected to seek cover and then return to normal activity. Lynx have a history of living in proximity to moderate human activity, and we do not expect any displacement of lynx by recreational activities in the area. As with other species, the chance of a lynx being disturbed by both a snow machine and helicopter at the same time is small. Disturbance from a helicopter would be expected to be short term. We don't expect heli-skiing activities to have significant additive effects to other recreational activities in the area.

Wolves - Wolves are found throughout the analysis area, also in relatively low numbers. Their presence and abundance is related closely to the presence of prey in an area. They would use all habitat types with the exception of lakes. If disturbed by a helicopter, snow machine, or skier they would be expected to move away from the disturbance and seek cover, and then return to normal activity. As with other species, the chance of a wolf being disturbed by both a snowmobile and helicopter at the same time is small, and such disturbance would be short-lived. Wolves breed in early spring, and we have no information on potential den sites in the area. Wolves are able to breed in areas of moderate human activity, however, and we don't expect displacement by current activity levels.

Wolverines have very large home ranges and therefore normally occur in very low densities. Adult males in south-central Alaska have home ranges of 535 square kilometers. Adult females with young in south-central Alaska have a home range of 105 square kilometers (Whitman, et al. 1986). Adult male home ranges generally overlap several female home ranges. Wolverines travel long distances to forage and tend to avoid human interaction. In the event of a disturbance, the animal will probably move away to seek cover and continue foraging after the disturbance event. We do not expect heli-skiing activities to significantly affect foraging behavior.

Denning wolverines, however, are more reactive to human presence. Denning occurs late winter through early spring, during which wolverines seek to avoid disturbance. Denning wolverines are sensitive to human disturbance, and human presence in an area can lead to relocation of the den site. Because wolverine densities are so low, chances of encounter are small. In addition, the energy expenditure required for relocation will probably not affect overall survival. Looking at cumulative effects, it is possible that a wolverine displaced by snow machine activity could then be further displaced by heli-skiing activities. At current levels of recreational activity, this scenario is unlikely and a large amount of undisturbed denning habitat is still available. In addition, snowmachine operators tend to use lower elevation areas that are unlikely to be used for denning. We do not expect a significant additive effect of heli-skiing with other recreation activities on wolverine survival at current recreational levels.

Owls, eagles, and goshawks may occasionally begin early nesting at lower elevations, but the chance of an encounter with a winter recreationist is slight, partly due to poor snow conditions in the lower elevation during that time of year. Heli-skiing activities will generally be away from nesting habitat for raptors. We expect little or no cumulative effect of heli-skiing and other recreational activities on these species.

Mountain goats inhabit cliffy, alpine environment and seldom encounter winter recreationists. Disturbance is mainly limited to occasional aircraft overflights or a snow machine operator. Goats are occasionally taken by predators such as wolves. Goat/snow machine interactions are most likely to occur in the Marshall Pass area. This area is off limits to heli-skiing, however, so no cumulative effects with heliski activities should occur. In addition, most of the terrain used by goats, especially in the kidding season, is not accessible by snow machines because of its cliffy character. Kidding starts around mid-May, which is too late to be affected by the snow machine season.

Sensitive Species

A Biological Evaluation (BE) was prepared for endangered, threatened, or sensitive species that could occur within the analysis area and is attached as Appendix II. The following endangered, threatened or Region 10 sensitive wildlife species are known to occur on the Chugach National Forest:

Table 3.3 – Region 10 Sensitive Wildlife Species

<u>Species</u>	<u>Status</u>
Humpback Whale	Endangered
Stellar Sea Lion	Threatened
Montague Island Vole	Sensitive
Trumpeter Swan	Sensitive
Dusky Canada Goose	Sensitive
Osprey	Sensitive
Peale's Peregrine Falcon	Sensitive

Species Distribution and Effects Analysis

Trumpeter swans and dusky Canada geese are the only species that might occur within the analysis area. As stated in the BE, these species might be present at the end of the heli-ski season, but would be well away from heli-ski activities and would not be affected. The proposed activity would not have an adverse impact on any of these species or their habitats. Allowing guided heli-skiing in the area will not move these species or their habitats to listing as a threatened or endangered species.

Issue 3 - What effect will guided heli-skiing have on adjacent private lands and bordering state and federal lands?

Of the approximate 337,000 total acres of the analysis area, approximately 1/3 (or 111,000 acres) is privately owned by the Chugach Alaska Corporation and the Tatitlek Corporation. Private lands are displayed on the Guided Heli-ski Area Analysis Map (refer to page iii). The Corporations have nearly obtained their full entitlement in the area under the provisions of the Alaska Native Claims Settlement Act (ANCSA) of 1971 but some conveyances are still being processed. Private lands occur along the west bank of the Copper River and within the Tasnuna River and Cleave Creek

drainages. Most of these lands occur at low elevations below the proposed ski zones on National Forest System lands but there is potential for activities occurring on National Forest to directly or indirectly affect private lands through trespass or unauthorized use.

Other lands administered by the State of Alaska, the Bureau of Land Management (BLM) and the National Park Service (NPS) lie adjacent to the project area. The BLM manages lands predominantly to the north of the project. The State of Alaska manages lands predominantly to the west of the project area with the exception of one parcel of 31 sections managed by the BLM. The NPS manages the Wrangell Saint Elias National Park on the east side of the project area. These adjacent lands occur at various elevations and there is potential for activities occurring on National Forest System lands to directly or indirectly affect these lands.

Alternative 1 – (No Action---i.e. no permits issued) - This alternative would leave the project area accessible only to cross-country skiers, ski touring, private groups that use fixed-wing aircraft or helicopters to access ski terrain, or snow machines. The amount of activity associated with heli-skiing would be removed from the area and any potential direct or indirect effects to private or other agency lands would also be removed. There is no potential for direct or indirect effects under this alternative.

Alternatives 2, 3, and 4 (1, 2, or multiple operators) - Permitting heli-ski activities on the National Forest will likely create direct and indirect effects to private and other agency lands incrementally dependent on the amount of activity and the number of operators under permit. The more operators and helicopters (up to eight maximum) operating on the National Forest the greater the chances will be for effects to other land owners and agencies. There is an increased potential for trespass or unauthorized commercial heli-ski activities. There is also an increased potential for aircraft incident, crash or fuel spill. While the potential for trespass increases incrementally with number of helicopters operating and numbers of skiers in the area, mitigation measures listed on page 20 require heli-ski operators to use GPS equipment and maps to insure their activities occur only on National Forest System lands and not on other land where their activities are not authorized. The Forest Service will also monitor the use in the area to help ensure that activities are occurring in the proper locations. The potential for trespass or unauthorized activities on other lands therefore is expected to be minimal. The potential for aircraft incident, crash or fuel spill increases incrementally with the number of helicopters operating and numbers of skiers in the area. The Forest Service requires helicopters to operate at FAA standards and has placed a restriction on the maximum number of helicopters (8) that may operate within the analysis area at one time.

Cumulative effects for Issue 3 - Currently with the addition of BLM and USFS lands available for commercial heli-ski activities it is expected that use will become more dispersed for a time. However all winter sports activities within the area are likely to increase in the future and create some cumulative effects. It is expected the agencies will seek to control the amount of use and ultimately will likely set a maximum amount of use for all affected agency lands.

Issue 4 – What is the effect of the number of permits issued for the area on the safety of the users in the area.

A mountainous environment always has some risk that is assumed by the people engaging in outdoor activities. This is true of helicopter skiing. However, careful planning and execution can minimize this risk. The Forest Service requires detailed Operations and Safety Plans from all heli-ski operators which must include a detailed: 1) Communications Plan: 2) Aircraft Operations Plan: 3) Hazards Evaluation and Forecasting Plan (including flight conditions, avalanche assessment, fueling and weather) and: 4) Emergency Procedures and Mobilization Plan. Helicopter pilots are required to follow FAA regulations. For heli-skiers, as well as other skiers and snowmobilers, avalanches and backcountry travel pose one of the greatest risks. Proper preparedness and good management of that risk depends on knowledge of current snow conditions and the ability to accurately predict snow stability (avalanche forecasting), and backcountry survival. It is a continuous process of integrating pertinent data, which begins before the first snow of winter and ends when the snow pack is gone.

The effect of the number of permits issued for the area on the safety of the users in the area varies by alternative, but is felt to be lowest risk or highest degree of safety for alternative 1, low risk and high degree of safety for alternatives 2 and 3, and higher risk and lower degree of safety for alternative 4. A discussion follows:

Alternative 1 – (No Action---i.e. no permits issued) - Not permitting guided helicopter skiing would result in a reduction in the level of use currently permitted. This alternative would leave the project area accessible primarily to cross-country skiers, ski touring, private groups that use fixed-wing aircraft or helicopters to access ski terrain, or snow machines. The amount of activity associated with commercial heli-skiing would be removed from the area and there would be a reduction in overall use of the area. Because this alternative results in the least amount of use of the area by aircraft, there would be a corresponding low (lowest) risk of an aircraft incident. If a backcountry incident did occur (avalanche, broken leg, snow machine breakdown, etc), having fewer helicopters in the area to provide assistance, rescue and transport to a hospital could actually result in a slightly lower overall level of safety than if some commercial helicopters were operating in the area.

Alternatives 2, 3, and 4 (1, 2, or multiple operators) - With as many as 8 and as few as a single helicopter (or no helicopter) operating within the region there is a range of potential exposures and affects. The greater the number of helicopters operating in the area the greater the potential risk becomes for reducing air safety. However, with one operator (alternative 2) or two operators (alternative 3) it is considered that good communications will exist between helicopters, and safety risks will be minimal.

Permitting heli-ski activities on the National Forest will likely increase the potential for risk in the analysis incrementally dependent on the amount of activity and the number of operators under permit. The more operators and helicopters (up to eight maximum) operating on the National Forest the greater the chances will be for risk to people involved in heli-ski activities, other forest users or other aircraft within the area. As use of the area increases due to more operators (permittees) and helicopters using the analysis area, increased risks can be expected from aircraft travel and the potential for aircraft incident, crash or fuel spill; skiing accidents, backcountry survival incidents, and avalanches.

While the potential for risk increases as the number of aircraft and operators using the area increases, required Operation and Safety Plans coupled with experienced and trained guides helps to mitigate and minimize that risk. The Forest Service requires helicopters to operate at FAA standards and has placed a restriction on the maximum number of helicopters (8) which may operate within the analysis area at one time per the mitigation measures listed on page 20. The Forest Service will also continue to monitor and evaluate heli-ski operators for safety compliance and field conditions such as safe numbers of operating helicopters to help insure that a high standard of safety is maintained.

As the number of operators increases (up to a maximum of three or more operators in alternative 4) and the number of helicopters working in the analysis area increases (up to the maximum of eight) it can be expected that the hours of helicopter flight time logged will increase, air traffic congestion will increase, use of primary flight paths, passes, and flight corridors will increase, the likelihood of encountering other groups and fly-bys occurring will increase, and the potential risk for a “close call” or an aircraft accident occurring would also increase.

Because the analysis area includes a very large area (approximately 225,000 National Forest System acres) spread out between 7 (seven) regions, it is expected use by one operator (**alternative 2**, estimated 3 helicopters average) or two operators (**alternative 3**, estimated 6 helicopters average) would be largely absorbed by the size of the area and regions within which to spread out the people and use. It is also expected that communication and coordination between helicopters from two companies (permit holders) is expected to be very good, which would result in fewer fly-bys, encounters between groups, and a greater degree of dispersal between regions, and therefore a higher degree of safety for helicopters and users.

With three or more operators (**alternative 4**) the maximum constrained limit of eight helicopters working in the area at one time would be reached on a nearly continuous basis. The ability of the seven regions to safely absorb this additional use would be decreased because more helicopters would be flying in the area more frequently at any given time. Because (estimated limit of eight) helicopters from three or more companies would be competing for air space, and communication and coordination between (three or more) competing companies would be expected to be less, it is expected a higher number of fly-by's would occur, noise levels would be greater, encounters between groups would increase, and the potential for a “close call” or aircraft accident occurring would increase. Under alternative 4, due to the potential for numerous aircraft (eight) and numerous operators (three or more) and the greater potential for communication breakdown to occur, the potential for helicopter and user safety to be compromised under this alternative is considered to be greater.

Cumulative effects for Issue 4 - Currently with the addition of BLM and USFS lands available for commercial heli-ski activities it is expected that use will become more dispersed for a time. Dispersal of use will likely aid in reducing the amount of risk associated with busy helicopter traffic now occurring over state lands in heli-ski areas of Thompson Pass. However all winter sports activities within the area are likely to increase in the future and ultimately will likely create some cumulative effects. It is expected in time the agencies will seek to control the amount of use and will likely set a maximum amount of use for all affected agency lands. Since guided heli-skiing is limited to the winter season (February 1 to April 30), there would be no cumulative effects associated with increased aircraft use to safety during other seasons.

While the actual amount of time that a helicopter is in the air moving skiers from one run to another is not long (estimated 2-4 minutes), the cumulative flight time associated with up to eight helicopters operating in the seven regions could result in numerous helicopters being in the air simultaneously within the permit area throughout most of each operating day. As more helicopters are in the air within the area, the cumulative affect to air safety would be a higher degree of risk and a lower degree of safety. This risk can be mitigated by limiting the number of operators and helicopters using the area, and by strictly adhering to required FAA rules and regulations and Forest Service Required Helicopter Operations and Safety Plans.

Other Environmental Considerations

This section is a disclosure of effects on other resources. The purpose is to document that these resources were considered as part of this analysis. Several resources and uses of the area are likely to be unaffected by the proposed action or alternatives, or will be affected to a minor degree. Resources or uses for which no measurable effects were identified are discussed briefly here.

Air Quality - All of the action alternatives will have limited, short-term effects on ambient air quality. Such effects, in the form of vehicle emissions and dust, are likely to be indistinguishable from other local sources of airborne particulates such as other aircrafty emmissions. Estimates of hydrocarbon emissions from helicopters are based upon engine emission specifications from an A-Star AS350 B2 helicopter. The proposed operating season is assumed to run from February through April, approximately 89 days. During that time period helicopters average about 9 hours of flight time per day.

Calculation for maximum hours of operating season for air emissions:

89 days X 9 hours/day = 801 maximum hours per operating season of potential emissions of exhaust.

Calculation for actual hours of use (based on 2001 operating seasons):

March 1 to April 30 = 61 days. 61 days possible, 36 days actually used due to weather and other factors. 36 days x 9 hours/day=324 total hours for helicopter emissions

The helicopter burns approximately 158 kilograms (351 pounds) of fuel per hour, and emits the following:

28 grams(.0617 lbs.)/hour of unburned hydrocarbons (HC)

744 grams(1.6 lbs)/hour of Carbon Monoxide (CO)

982 grams(2.165 lb)/hour of Nitric Oxides (NOx).

Table 3.4

	Maximum Use	Actual Use
Fuel	281,151 pounds, or 40,164 gallons	113,724 pounds*, or 16,246 gallons
HC	49 pounds	20 pounds
CO	1,282 pounds	518 pounds
NOx	1,734pounds	702 pounds
Total emissions	3,065	1,240

* Not shown are pounds of water vapor and carbon dioxide.

To put this in perspective the average annual emission for an "average" passenger car is 80 pounds of HC; 606 pounds of CO; and 41 pounds of NOx for a total emission of 727 pounds

Facilities – No facilities are proposed in the analysis area.

Heritage Resources – Revised Forest Plan standards and guidelines for the identification and protection of heritage (cultural and historical) resources apply. No proposed activities are located in or near known cultural resource properties, or within areas having a high probability of such properties occurring.

Land Status - Under the Alaska Statehood Act of 1959, the State of Alaska is entitled to a certain amount of Federal land. The State was also allowed to identify for selection more acreage than would ultimately be conveyed to State ownership. No state selected lands occur within the analysis area. The Alaska Native Claims Settlement Act (ANCSA) granted Alaska Native Corporations similar selection rights. Approximately 111,000 acres of conveyed native corporation land occurs within the analysis area. Minor quantities of selected but as yet unconveyed lands occur within the area. Should any such selections be conveyed they will be removed from the special use permit.

Minerals - The proposed action would have no direct or indirect impact on mineral resources.

Plans of Other Agencies - The CEQ regulations for implementing NEPA require a determination of possible conflicts between the proposed action and the objectives of other federal, State, and local land use plans, policies, and controls for the area. The Bureau of Land Management and the State of Alaska both have permitted heli-ski activities that occur on their lands adjacent to the analysis area. The Bureau of Land Management is currently involved in the development of their second Environmental Assessment for commercial heli-ski operations in the last two years. The Forest Service is working with these agencies as much as is possible in the hopes of providing seamless management across the borders.

Consistency with CFR 241.22 and ANILCA 501(b) Primary Purpose Direction – The Copper River Delta is mandated under ANILCA section 501(b) to be managed primarily for the conservation of fish and wildlife and their habitat. Because Forest Service proposals involving the Copper River Delta have been sensitive to the ANILCA mandate, over time few management activities have affected the rich wildlife and fish resources and habitat of the Copper River Delta.

CFR 241.22 states that a multiple-use activity may be permitted or authorized within the areas of the Chugach National Forest (ANILCA 501(b)) only after a determination by the responsible Forest Officer that such activity is consistent with the conservation of fish, wildlife, and their habitat. A use or activity may be determined to be consistent if it will not materially interfere with or detract from the conservation of fish, wildlife and their habitat.

The proposal to allow commercially guided helicopter skiing in the Allen Glacier to Cleave Creek Area of the Cordova Ranger District as described in this Environmental Assessment is consistent with the ANILCA primary purpose direction. There are several reasons why this proposal meets this primary purpose direction which are outlined below:

1. The document analyzes various wildlife "focus species" which occur in the analysis area during the timeframe when the heli-skiing proposal would be

occurring (February 1 – April 30) and the expected effects heli-skiing would have on these focus species. Based on this analysis heli-skiing would not have a significant effect on any of the species listed.

2. A Biological Evaluation (BE) was prepared for endangered, threatened, or sensitive species that could occur within the analysis area (see Table 3.3 – Region 10 Sensitive Wildlife Species). As stated in the BE, the proposed activity would not have an adverse impact on any of the species listed or their habitats.
3. Because the proposal occurs during the winter in a snow covered environment under frozen conditions and no ground disturbing activities are proposed, no known affects to anadromous or other fisheries are expected from the proposed activity.
4. Mountain Goats are the wildlife species of concern in the analysis area. There is an extensive analysis on mountain goats, mountain goat use and habitat in the area and the potential effects of this heli-ski proposal on mountain goats (refer to the Environmental Analysis Report Mountain Goat sections). Because skiing will be limited to those areas outside of goat habitat, no helicopter landings will occur from May 15 through June 15 to avoid the goat kidding period, helicopters shall not land within ½ mile of any area identified as winter goat habitat, the Forest Service has conducted goat surveys in the area identifying goat habitat, and as a result of other mitigation measures identified in this Environmental Assessment, expected disturbance to Mountain Goats and other wildlife as a result of this heli-ski proposal are expected to be minimal.

In consideration of the factors listed above and other factors discussed in this Environmental Assessment, the proposal to allow commercially guided helicopter skiing in the Allen Glacier to Cleave Creek Area of the Cordova Range District is consistent with *CFR 241.22* and the ANILCA 501(b) mandate for the Copper River Delta.

Findings and Disclosures

Several of the laws and executive orders listed in Chapter 1 require project-specific findings or other disclosures. These findings or disclosures apply to all alternatives considered in detail.

National Forest Management Act (NFMA) - All project alternatives fully comply with the 2001 Revised Chugach National Forest Plan and Record of Decision (ROD). This project incorporates all applicable forest-wide standards and guidelines and management area prescriptions as they apply to the project area, and complies with Forest Plan goals and objectives.

The Revised Forest Plan complies with all resource integration and management requirements of 36 CFR 219 (219.14 through 219.27). Application of Forest Plan direction for the analysis area ensures compliance at the project level.

Endangered Species Act - None of the alternatives is anticipated to have a direct, indirect or cumulative effect on any threatened or endangered species in or outside the analysis area. All helicopter landings would occur on ice, rock and snow. This activity would have no effect upon any federally listed threatened, endangered or sensitive species of plants or animals. A complete Biological Evaluation (B.E.) is attached at page 63 as Appendix II.

National Historic Preservation Act - No significant effects on known or unknown cultural resources are anticipated. The Forest Service program for compliance with the National Historic Preservation Act includes locating, inventorying and nominating all cultural sites that may be directly or indirectly be affected by the scheduled activities. No cultural site survey is required on snow and ice fields per the Programmatic Agreement between the Forest Service, State Historic Preservation Officer and the Advisory Committee. If during the helicopter landing activity any historic, prehistoric, or paleontological objects or sites are discovered, the heli-ski operator must notify the Forest Service. Items of historic, prehistoric, or paleontological value are protected under various Federal laws, including the Antiquities Act of 1906 (16 USC 433) and the Archeological Resources Protection Act of 1979 (16 USC 470ee), and Federal regulations.

Alaska National Interest Lands Conservation Act (ANILCA) - An ANILCA Section 810 subsistence evaluation has been conducted. No significant restrictions on the abundance and distribution of, access to, or competition for subsistence resources in the analysis area are anticipated. The effects of this action have been evaluated to determine potential effects on subsistence opportunities and resources. There is no documented or reported subsistence use that would be restricted as a result of this decision.

Clean Water Act - The design of the special-use permit is in accordance with Forest Plan standards and guidelines, the best management practices, and applicable Forest Service manual and handbook direction. The permit(s) would include specific requirements prescribed to prevent or reduce water pollution. Monitoring and evaluation of the implementation and effectiveness of Forest Plan standards and guidelines and Best Management Practices will occur. Project activities are expected to meet all applicable State of Alaska water quality standards.

No permits under Section 404 of the Clean Water Act will be required.

Clean Air Act - Emissions anticipated from the implementation of any project alternative would be of short duration and are not expected to exceed State of Alaska ambient air quality standards (18 AAC 50).

Coastal Zone Management Act - The Coastal Zone Management Act requires the Forest Service, when conducting or authorizing activities or undertaking development directly affecting the coastal zone, to ensure that the activities or development be consistent with the approved Alaska Coastal Management Program to the maximum extent practicable. Helicopter skiing is not in a category identified by the Department of Governmental Coordination, Alaska Coastal Management Program that needs a consistency review prior to permit issuance.

Executive Order 11988, Executive Order 11990, and Executive Order 12962 – This use of National Forest System lands would not have any effects on floodplains, wetlands or freshwater or marine resources. This activity is not located within a flood plain as defined by Executive Order 11988, is not located within wetlands as defined in Executive Order 11990 and is not located near any freshwater or marine resources.

Executive Order 12898 - Implementation of any alternative is not anticipated to cause disproportionate adverse human health or environmental effects to minority or low-income populations.

Appendix I. AGENCIES AND PERSONS CONSULTED

Interdisciplinary Team:

Forest Service Specialists, Resource Personnel

Susan E. Kesti, Silviculturist - Team Leader, Cordova Ranger District

Bob Behrends, Public Services Officer, Cordova Ranger District

Bruce Campbell, Interim Team leader, Lands Specialist, Cordova Ranger District

Paul Meyers, Wildlife Biologist, Cordova Ranger District

Others Consulted:

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Bureau of Land Management

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Appendix II. –Biological Evaluation

CHUGACH NATIONAL FOREST CORDOVA RANGER DISTRICT

BIOLOGICAL EVALUATION FOR THREATENED, ENDANGERED, PROPOSED, AND SENSITIVE PLANT AND ANIMAL SPECIES

Guided Heliski Permits in the Tasnuna/Cleave Creek Drainage

Prepared by: Paul Meyers _____
District Wildlife Biologist

Date: _11/21/2001_

Reviewed by: Daniel Logan _____
District Wildlife Staff Biologist

Date: _11/26/2001_

Reviewed by: Deyna Kuntzsch _____
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Date: _1/30/2002_

Biological Evaluation

Guided Heliski Permits in the Tasnuna/Cleave Creek Drainage

Introduction

The purpose of a Biological Evaluation (BE) is to address the potential effects of proposed low impact land management projects on Threatened (T), Endangered (E), Proposed (P), and Sensitive (S) flora and fauna. The BE is a review of proposed activities in sufficient detail to document effects on species listed as Threatened, Endangered, or Proposed by the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS), and to determine whether formal consultation with these agencies is required. Sensitive species are designated by the USDA Forest Service, and any adverse effects on these species will be addressed according to agency procedures.

Additionally, a BE will assess the potential effects on "essential fish habitat" (EFH), as mandated by the recent EFH amendments to the 1996 Magnuson-Stevens Fishery Management and Conservation Act (Federal Register 1998). The BE will determine if the proposed activity may adversely affect EFH, in which case the action agency will consult with NMFS and address their recommendations for mitigation. If it is determined through the BE process that there will be no adverse effects, no consultation is required. Concurrence is not required for findings of beneficial effects.

This B.E. was prepared in accordance with the direction provided in Section 2672.42 of the Forest Service Manual (FSM), based on personal observation of suitable habitat, literature review, and contact with other professionals knowledgeable of species habitat requirements. The content of this document conforms with legal requirements set forth under Section 7 of the Endangered Species Act (19 USC 1536(c), 50 CFR 402.12(f) and 402.14(c)), and the Magnuson-Stevens Fishery Management and Conservation Act (Federal Register 1998).

Description of the Proposed Project

A request has been made to open the Tasnuna/Cleave Creek area to guided heliskiing. This activity would allow up to 6 helicopters per day from 1 January–1 May. Helicopters would hold 4–6 skiers and would be allowed multiple drop-offs and pick-ups during the course of each day. Helicopters would land at the head and foot of the pre-determined ski runs. In general, drop-offs would occur at peaks or high ridgelines, and pick-ups would occur on glaciers. Skiing would occur only in conditions of good snow cover, so helicopter landings would take place on snow-covered surfaces.

Existing Environment

The project area is located on National Forest System lands north of Cordova, Alaska, in the Tasnuna River and Cleave Creek watersheds east of Marshall Pass and west of the Copper River. The entire project area encompasses approximately 300,000 acres. The area ranges from mountaintops to river valleys. Habitats include rock and ice, glaciers, alpine, mixed forest, and coniferous forest. Winter mammals include mountain goats (*Oreamnos americanus*), gray wolves (*Canis lupus*), moose (*Alces alces*), wolverines (*Gulo luscus*), brown bears (*Ursus arctos*), black

bears (*Ursus americanus*), voles (*Clethrionomys spp.*), and short-tailed weasel (*Mustela erminea*). Birds include boreal owls (*Aegolius funereus*), bald eagles (*Haliaeetus leucocephalus*), spruce grouse (*Falcapennis Canadensis*), ptarmigan (*Lagopus spp.*), and various passerines.

Recreational activity includes skiing, snowmobiling, fishing, hunting, hiking, and flight-seeing.

Threatened, Endangered, Proposed, and Sensitive Species in the Project Area

Listing of the humpback whale (*Megaptera novaeangliae*) preceded the Federal Endangered Species Act of 1973 and was designated endangered in 1970 (Federal Register 1970). The Steller sea lion (*Eumetopias jubatus*) is also listed as endangered (Federal Register 1997). Both species are not found in or adjacent to the project area.

Steller's eider (*Polysticta stelleri*) has been proposed for listing as threatened (50 CFR 50:134). This species occurs in southwestern Alaska, but would not be found in or near the project area.

The Alaska Region developed the Regional Forester's Sensitive Species List in 1990 and amended it in 1994. This list was developed pursuant to Forest Service Manual (FSM) Chapter 2670, Threatened, Endangered, and Sensitive Species (TES) to identify those species in the Alaska Region with viability concerns.

The Regional Forester's Sensitive Species List includes 5 vertebrate species known to occur within the Chugach National Forest. These are the Montague Island tundra vole (*Microtus oeconomus elymocetes*), trumpeter swan (*Cygnus buccinator*), dusky Canada goose (*Branta canadensis occidentalis*), osprey (*Pandion haliaetus*), and Peale's peregrine falcon (*Falco peregrinus pealei*) (USDA Forest Service, 1994).

The bald eagle (*Haliaeetus leucocephalis*) is not a listed species, but it is under federal protection and is included as a species to be considered when analyzing the effects of projects on National Forest lands. In accordance with a memorandum of understanding with the U.S. Fish and Wildlife Service, " ... activities inconsistent with current bald eagle use ... " will not occur within 330 feet of nest trees. Another condition is to: "Avoid repeated helicopter flights within 1/4 mile of active bald eagle nests, particularly with large helicopters used for yarding timber."

The Regional Forester's Sensitive Species List includes seven plant species known to occur within the Cordova Ranger District. These are:

1. Crucifer (no common name) (*Aphragmus eschscholtzianus*)
2. Norberg arnica (*Arnica lessingii ssp. norbergii*)
3. Goose-grass sedge (*Carex lenticularis var. dolia*)
4. Alaskan pretty shooting star (*Dodecathon pulchellum*)
5. Truncate quillwort (*Isoetes truncata*)
6. Choris bog orchid (*Platanthera chorisiana*)
7. Unalaska mist-maiden (*Romanzoffia unalaschcensis*)

Crucifer

This plant is a dwarf species found in wet areas of tundra and heath, often near running water. There have been no reports of this plant below elevations of 2,800 feet. It has been found on the Seward Peninsula.

Norberg arnica

According to Hulten (1968), this subspecies may merely be a local variation, a southern condition of the species with tall stems and several pairs of stem leaves. Its taxonomic status is questionable and it may only be a taller and more robust southern variation of the relatively common typical variety. It is found in alpine and sub alpine meadows, arctic and alpine tundra, heath, and open woods habitats. Of five known global collection sites, one is from the Cordova Ranger District near Orca.

Goose grass sedge

This plant is similar to other more common types of *C. lenticularis*, which may make it difficult to identify. It occurs in alpine areas, wet meadows, lakeshores, snow beds, and glacial areas. It has been found most often at higher elevations, but is not restricted to these areas. It has been found in the Thumb Bay area on Knight Island at an elevation of 625 ft.

Alaska pretty shooting star

This subspecies is reported to be a coastal polyploid race of an interior diploid species, which makes it difficult to distinguish and which makes the taxonomic validity questionable. It is found in moist open areas such as muskeg meadows. It has been reported on the Cordova Ranger District.

Truncate quillwort

This species is also taxonomically questionable and exists in only a few known widely isolated populations. It occurs in shallow water habitats and is a perennial submerged aquatic with corm-like rootstock. Of two element occurrences, one is from the Cordova Ranger District on the Copper River Delta.

Choris bog orchid

This species grows in heaths, swamps, sphagnum bogs, and moist, open habitats with acidic substrate. It has been found on Evans Island in Prince William Sound on the Glacier Ranger District and on the Cordova Ranger District.

Unalaska mist-maiden

This species has been found on rock outcrops and crevices, an uplifted beach terrace, rocky disturbed soil, and shorelines (USFS Region 10 unpublished guide). Hulten (1968) simply describes the habitat as "moist places." Although there are currently less than 20 separate locations known with certainty, others are believed likely. One element occurrence is on the Cordova Ranger District. It was identified on a "creek bed bar" along Hawkins Creek, Hawkins Island (USFS Region 10 unpublished guide).

Fish Species Covered by the EFH Provisions of the Magnuson-Stevens Act

Sockeye, chinook, and coho salmon run in the Copper River and its tributaries from May–November. Adult salmon will not be present during the heliski season. Juvenile salmon will be present during the winter months either under the ice or in open water.

Critical Habitat and Essential Fisheries Habitat

No critical habitat has been designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service in the project area. The nearest critical habitat is located 60 miles south of the project area where a Steller sea lion breeding site exists on Wooded Island.

The National Marine Fisheries Service has defined EFH as all of the streams with pacific salmon as listed in the Alaska Department of Fish and Game Anadromous Waters Catalog. Essentially, this is any body of water where salmon are found. This includes the Copper and Tasnuna Rivers.

Consultation to Date

On April 30, 1999, we talked with Matt Eagleton, Fisheries Biologist, National Marine Fisheries Service, about EFH. He explained the designation of EFH and said that the determination of adverse effects is made by the action agency. Consultation is not necessary unless there is a determination that there may be adverse effects.

Current Management Direction

Current Management direction is the Chugach National Forest Land and Resource Management Plan of 1984. This plan is currently being amended, and we expect the Chugach National Forest Plan to be out in winter 2002.

Effects of the Project on Threatened, Endangered, Proposed, and Sensitive Species

Direct Effects

Animal Species

Heliskiing will occur during late winter and early spring. All activity will occur in the air or above the snow. No habitat will be altered by these activities. Any effects on animals would come in the form disturbance through noise or direct encounters. Mitigation measures requiring helicopters to fly at 1500 feet above the surface will reduce impacts of noise. Drop-offs will occur at high elevations, and pick-ups will occur on glaciers. In addition skiers will be using non-vegetated chutes and will avoid most animal species.

Humpback Whale, Steller's Sea Lion, Steller's Eider: All of these species are saltwater inhabitants that do not occur on or near the project area. There will be no effects on these species.

Montague Island Tundra Vole: This species is found only on Montague Island and not near the project site.

Bald Eagle: Bald eagles are found throughout the area in summer. Winter densities of bald eagles are likely to be low because the eagles will move out toward the coast and open water during that time of year. Eagles that do stay in the Tasnuna and Copper River valleys will use low-lying areas in winter near open water. Skiing will occur in higher elevations away from forested areas. Encounters may occur with foraging birds, but nest sites should be well away from heliski activities. Federal regulations require that incompatible activity will not occur within 330 yards of the nest. The heliskiing permit will require that helicopters stay at least 1 mile away from wildlife. Following these measures should result in no effect on bald eagles.

Dusky Canada Goose: The dusky Canada goose nest only on the Copper River Delta and is not found in the project area. There will be no effect on this species.

Trumpeter Swan: Trumpeter swans nest in the Copper and Tasnuna River valleys in spring. Trumpeter Swans will begin prospecting for nesting sites in late April, which coincides with the end of the heliskiing season. These birds will remain on the low-lying wetland areas and will be well away from heliskiing activity. Potential disturbance exists from helicopter noise. Helicopters will be required to stay at least 1 mile from wildlife, however, which will eliminate adverse effects. Following this procedure should result in no effects on trumpeter swans.

Osprey: Although unlikely, it is possible that osprey may be encountered. Osprey and their nests would most likely be found along lakes or larger streams in the low-lying regions. Heliskiing activity will occur in the higher elevations. Potential disturbance exists from helicopter noise. Helicopters will be required to stay at least 1 mile from wildlife, however, which will eliminate adverse effects. Following this procedure should result in no effects on Osprey.

Plant Species

Crucifer and Norberg arnica: These species may be found on the project area in summer, but will be under snow in winter. Heliskiing activity will not affect either the plant or plant habitat.

Truncate Quillwort: This species is a submerged aquatic and may exist in the freshwater ponds on the low-lying areas. Heliskiing activity will not affect either the plant or plant habitat.

Goose Grass Sedge: This species could be present in the project area in the summer, but would be under snow in the winter. Heliskiing activity will not affect either the plant or plant habitat.

Alaska Pretty Shooting Star, Choris Bog Orchid, Unalaska Mist-maiden: These species may occur in the low-lying regions, though it is unlikely. The low-lying area is away from heliskiing activity and will be snow-covered for most of the winter. Heliskiing activity will not affect either the plant or plant habitat.

Fish Species Covered by the EFH Provisions of the Magnuson-Stevens Act

The Copper and Tasnuna Rivers support Sockeye, Chinook, and Coho salmon runs late spring through fall. This timing does not coincide with the heliski season, so no direct disturbance will exist on adult salmon. Juvenile salmon will be present in these drainages during the winter months either under the ice or in open waters. Heliski activity in the Tasnuna valley will be restricted to helicopter overflights. All ski runs occur over the valley ridge and are directed away from the valley. In addition heliski activities will occur in the higher elevations where juvenile salmon are

unlikely to occur. No heliskiing activity will occur in the Copper River valley. There should be no effects of heliski activity on these species.

Essential Fish Habitat

Heliski activities will have no affect on fish habitat. Helicopter landings and skiing activities will occur on snow and ice-covered areas. In addition activities will occur at higher elevation away from essential fish habitat.

Indirect Effects

Animal Species

This project entails very limited disturbance and we can conceive of no indirect effects to TESP animal species.

Plant Species

This project entails very limited disturbance and we can conceive of no indirect effects to plant species.

Essential Fish Habitat

This project entails very limited disturbance and we can conceive of no indirect effects to Essential Fish Habitat.

Cumulative Effects

TEPS Species

This project will cause no adverse effects to TEPS species, and therefore, will not cause any cumulative adverse effects.

Essential Fish Habitat

This project will cause no cumulative effects on EFH.

Determination

It is possible that TEPS plant or animal species may be found in the proposed project area. Because heliski activities occur in winter, chances of encounter are slight. If TESP species are present, the proposed activities will not affect the individuals or alter any of their habitats. It is our determination that the proposed activities will have no effect on these species or their habitats. In addition, it is our determination that the proposed activities will have no effect on EFH.

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PG 66

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Appendix IV. - Summary Of Comments Received From Public Involvement and Scoping

Heliski
comment
summary
sheet sorted
by issue type
- updated
10/11/2002
comment #

comment #	issue - type	issue description	concern	level to address
21	adjacent ownership	lack of identifiable boundaries between federal and private lands	potential problem with trespass	analysis
21	adjacent ownership	do not allow operations on lands with pending conveyances	letter lists sections. T9S R2W exclude 11 & 12, T9S, R3E exclude sec 5,6,9,16,17,20,21, T9S, R2E exclude sec 1 - 4	
22	adjacent ownership	potential for trespass	support commercial recreation activity as long as activity remains on public lands	
9	cumulative impacts	show how it has addressed cumulative impacts of helicopters, snowmachines, fixed-wings aircrafts and motorboats and any other motorized uses on the forest and on areas adjacent	what areas will be closed to motorized uses on Cordova Ranger District and what will be open	Forest Plan
29	economics	Need close terrain w/in 15 miles	some clients can afford further terrain	analysis
17	expense	area under consideration not economically viable for regular groups	rarely economical to operate further than 10 to 20 miles from highway access.	analysis
1	NEPA process	do eis instead of ea	significance of impacts	process
3	NEPA process	Planning Level	Need complete EIS on year-round impacts of helicopters for entire CNF	process
4	NEPA process	Planning Level	Need complete EIS on year-round impacts of helicopters for entire CNF	process
5	NEPA process	Planning Level	Need complete EIS on year-round impacts of helicopters for entire CNF	process
6	NEPA process	Planning Level	Need complete EIS on year-round impacts of helicopters for entire CNF	process
8	NEPA process	Planning Level	Need complete EIS on year-round impacts of helicopters for entire CNF	process
9	NEPA process	Planning Level	Need complete EIS on year-round impacts of helicopters for entire CNF	process
9	noise	impacts to those seeking quiet recreational experience within permit area and on wildlife	address individual and cumulative impacts	<i>Forest Plan</i>

10	noise	motorized uses ruin chance for natural quiet		<i>Forest Plan</i>
11	noise	destroy quiet of unique area		<i>Forest Plan</i>
3	permit compliance	permits on state land & guides operating without a permit	low price does not result in revenues to allow adequate enforcement and compliance	permit enforcement
9	permit length	not clear how long permit is for		
17	Planning Level	consider all areas of Forest under consideration for Motorized Use	analyze all for heliski operations	Forest Plan
1	recreation	impacts of helicopters	significant impacts - make non motorized	Forest Plan
2	recreation	noise	recreationists seeking a quiet backcountry experience suffer as well as quality of life for residents	Forest Plan
4	recreation	noise	loss of naturally quiet areas,	Forest Plan
5	recreation	noise	loss of naturally quiet areas,	Forest Plan
6	recreation	noise	noise in wilderness areas	Forest Plan
8	recreation	noise	impacts of noise on wildlife and wilderness values	analysis
9	recreation	EA should include information about quiet recreationist attitudes and desires, year round opportunities for quiet and solitude in popular recreation areas and quiet recreational user displacement levels.	allocation to motorized use	Forest Plan
9	recreation	low number of users in certain areas should be a mgmt goal		<i>forest plan</i>
10	recreation	no non-motorized being considered	need comprehensive plan for Thompson Pass	Forest Plan
13	recreation	helicopter use in areas accessible by road	competition with other types of backcountry users & guides, in particular snocat guides	analysis
13	recreation	State doesn't have any areas closed to heli operations	competition with other types of backcountry users & guides, in particular snocat guides	analysis
15	recreation	opportunity - potential for heliski guiding in future	1 - 2 groups of 6 -12 people for 3 - 6 days 2 - 3 times.	analysis

16	recreation	opportunity - expressed interested in area	5 people per ship, 2 hr per 7 day minimum	analysis
16	recreation	opportunity - event permit for extreme ski event	10 day window for 3 day event	analysis
17	recreation	opportunity - for private groups due to expense	project fly 1 - 2 groups onto FS lands an average 3 days per week weather permitting	analysis
17	recreation	opportunity - can share area with other permittees	can work with VHSG and ABA - no difficulty	analysis
18	recreation	opportunity - provide heliski guide service for area	consider area as a whole for best ski experience. Divided area into regions based on snow conditions and weather	analysis
18	recreation	north slopes better conditions than others, North of Tasnuna has better weather than south of Tasnuna	to provide experience desired by skiers - have private ships deeper in backcountry	analysis
19	recreation	opportunity - provide heliski guide service for area	interested in providing service march 1 - May 31 2002	analysis
20	recreation	opportunity - provide heliski guide service for area	interested in providing service. Would like to initiate process with NFS, has started with State and BLM	analysis
23	recreation	opportunity - provide heliski guide service for area	favor grant exclusive use permits to heliski operators. VHSG is a lead operation in terms of quantity of skiers served, quality of its service, safety and respect for lands.	analysis
24	recreation	safety and quality fo ski/wilderness experience is enhanced with exclusive use	have one operator for entire area. Minimum "Books & Library" should be grouped	analysis
26	recreation	opportunity-provide heliski guide service for area	favor grant exclusive use permits to heliski operators. VHSG is a lead operation in terms of quantity of skiers served, quality of its service, safety and respect for lands.	analysis
30	recreation	opportunity-provide heliski guide service for area	award each operator a specific amount of time in the area.	analysis
7	safety	permit areas not overlapping	problems with conducting safe operations	analysis
12	safety	not issue multiple permits for one area	problem of operators racing clients to site and dropping people off on top of each other	analysis
14	safety	not issue multiple permits for one area	problem of operators racing clients to site and dropping people off on top of each other	analysis

18	safety	Only issue 1 permit for entire area	to ensure a safe and efficient operation. Can do circuit of regions	analysis
18	safety	not issue multiple permits for one area	problem of operators racing clients to site and dropping people off on top of each other	analysis
23	safety	safety and quality fo ski/wilderness experience is enhanced with exclusive use	area is large enough to accommodate exclusive use operations	analysis
24	safety	safety and quality fo ski/wilderness experience is enhanced with exclusive use	VHSG - provide max safety, very professional outfit	analysis
27	safety	safety and quality of ski/wilderness experience is enhanced with exclusive use	cleints don't have to compete for skiable terrain with other guide services or clients	analysis
28	safety	safety and quality of ski/wilderness experience is enhanced with exclusive use	divide area into two - one operator for each. Could support 2 operators	analysis
29	safety	Need variety of areas to bring clients	changing weather and snow conditions	analysis
3	wilderness	helicopter traffic degrade areas eligible for wilderness or wild & scenic status	areas may lose eligibility for wilderness designation	Forest Plan
4	wilderness	helicopter traffic degrade areas eligible for wilderness or wild & scenic status	areas may lose eligiblty for designation, loss of wilderness recreation opportunities and other wilderness values	Forest Plan
5	wilderness	helicopter traffic degrade areas eligible for wilderness or wild & scenic status	loss of wilderness recreation opportunities, consequences of allowing motorized activity in eligible wilderness and wild rivers areas	Forest Plan
6	wilderness	helicopter activity will have adverse impacts on areas eligible for wilderness	loss of wilderness recreation opportunities, consequences of allowing motorized activity in eligible wilderness and wild rivers areas	Forest Plan
8	wilderness	helicopter activity will have adverse impacts on areas eligible for wilderness	loss of wilderness value	Forest Plan

9	wilderness	impacts of helicopters	impacts of permit on future wilderness recommendations. To suggest heli-skiing does not have any permanent physical effect on the landscape does not answer our concerns	<i>Forest Planning level</i>
11	wilderness	destroy quiet wilderness experience		<i>Forest Planning level</i>
1	wildlife	impacts of helicopters	significant impacts - make non motorized	Forest Plan
4	wildlife	EIS address concerns about goat habitat, bear denning areas, impacts on raptors	goat habitat, bear denning, impacts on raptors	analysis
5	wildlife	goat habitat, bear denning areas, raptors	goat habitat, bear denning, impacts on raptors	analysis
6	wildlife	goat habitat, bear denning areas, raptors	goat habitat, bear denning, impacts on raptors	analysis
8	wildlife	goat habitat, bear denning areas, raptors	goat habitat, bear denning, impacts on raptors, displacement of animals	analysis
9	wildlife	impacts on species as mtn goats, raptors, brown bears and other species as black bear, moose, lynx, wolf, and wolverine	need baseline data on wildlife in permit area, show how FS will collect data before 2002 season, reveal monitoring plan	analysis
11	wildlife	noise negatively affect goat and raptor habitat and bear denning areas		analysis