United States Department of the Interior

NATIONAL PARK SERVICE
Glacier National Park
West Glacier, Montana 59936

IN REPLY REFER TO:

L76- GLAC-02-052, 02-088, 02-100,
03-006, 03-007, 03-014, 03-031

MAY 2 2003

Dear Friends:

Enclosed is Glacier National Park's Environmental Assessment (EA) to Conduct Additional Administrative Helicopter and Fixed-Wing Flights in 2003. The EA is also available on our website at www.nps.gov/glac. Glacier National Park proposes to conduct approximately 72 helicopter flights and up to 40 fixed-wing flights in 2003. These administrative flights would be used to remove waste from Granite Park Chalet and Patrol Cabin, deliver supplies for rehabilitation of Porcupine Lookout, perform maintenance and repairs on radio towers, and conduct research and monitoring of threatened wildlife species and species of concern.

Please send your comments by mail to Glacier National Park, Attn: Flight EA, P.O. Box 128, West Glacier, MT 59936. Comments may also be sent electronically to glac_public_comments@nps.gov, attention: Flight EA. The public comment period ends June 6, 2003.

Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. **If you wish us to withhold your address, you must state this prominently at the beginning of your comment.** We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Sincerely,

for Michael O. Holm
Superintendent

Enclosure

Environmental Assessment to Conduct Additional Administrative Helicopter and Fixed Wing Flights in 2003

Glacier National Park
West Glacier, Montana
U.S. Department of the Interior
National Park Service

April 2003

SUMMARY

During the course of a year, the National Park Service (NPS) uses helicopter and fixed-wing flights to deliver supplies and equipment to project sites and to perform maintenance of radio towers in the backcountry. Normally the number of flights averages around 50, which the NPS has determined to not cause a measurable effect.

Prior to 2003, 33 flights went through the environmental compliance process and received approval to proceed. These include 3 flights for the rehabilitation of the Going-to-the Sun Road, 20 flights (totaling only 2 ½ hours) at Logan Pass to complete the boardwalk rehabilitation project and 4-8 flights to Sperry Chalet to complete the Water Intake Project. During development of this EA the NPS determined that we could reduce the number of already approved flights to 25 by combining the helicopter used for the Logan Pass project with the work at Sperry Chalet.

At the beginning of 2003, approximately 112 new flights were proposed in addition to 25 flights that have already been approved. These flights would be used to remove waste from Granite Park Chalet and Patrol Cabin, to rehabilitate the Porcupine Lookout, to perform maintenance on radio towers, and to conduct research and monitoring of threatened and endangered wildlife species and species of concern. The effects of this increase in the number of flights is of concern, thus this Environmental Assessment (EA) has been prepared.

The preferred alternative is to conduct these additional administrative helicopter and fixed-wing flights in 2003 to complete these projects. The consequences of these flights on natural soundscapes, park operations, threatened and endangered species and species of concern, visitor experience, and wildlife are analyzed in this EA.

The preferred alternative would have no effect on air quality, aquatic species, cultural resources, environmental justice, prime and unique farmlands, socioeconomics, soils, vegetation, water resources, wetlands and floodplains, or wild and scenic rivers. There would be minor to moderate short-term adverse impacts to natural soundscapes, park operations, visitor experience, and wildlife. There would be long-term, minor to moderate beneficial impacts to threatened and endangered species and species of concern, and park operations.

If you wish to comment on this environmental assessment (EA), please send your comments to the address below, or transmit them via e-mail to: glac_public_comments@nps.gov. This environmental assessment will be on public review for 30 days in accordance with the National Environmental Policy Act. This environmental assessment is also available on our website at www.nps.gov/glac. Please note that names and addresses of people who comment become part of the public record. **If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment.** We will make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety. At the conclusion of the comment period, the National Park Service will either issue a notice of intent to prepare an environmental impact statement or a finding of no significant impact.

Superintendent
Attention: 2003 Flights EA
Glacier National Park
West Glacier, MT 59936

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PURPOSE AND NEED

Background

Glacier National Park is situated on the Canadian border in the northwestern section of Montana. The park is in the Rocky Mountains in the northern United States, and contains the rugged mountains of the Continental Divide. Together with Canada's Waterton National Park, it forms the Waterton-Glacier International Peace Park, and is a World Heritage Site. Superb natural resources are found in both parks.

The purpose of Glacier National Park is to:

- Preserve and protect natural and cultural resources unimpaired for future generations (1916 Organic Act);
- Provide opportunities to experience, understand, appreciate, and enjoy Glacier National Park consistent with the preservation of resources in a state of nature (1910 legislation establishing Glacier National Park); and
- Celebrate the on-going peace, friendship, and goodwill among nations, recognizing the need for cooperation in a world of shared resources (1932 International Peace Park legislation).

Glacier's significance is explained relative to its natural and cultural heritage:

- Glacier's scenery dramatically illustrates an exceptionally long geological history and the many geological processes associated with mountain building and glaciation;
- Glacier offers relatively accessible spectacular scenery and increasingly rare primitive wilderness experience;
- Glacier is at the core of the "Crown of the Continent" ecosystem, one of the most ecologically intact areas remaining in the temperate regions of the world;
- Glacier's cultural resources chronicle the history of human activities (prehistoric people, American Indians, early explorers, railroad development, and modern use and visitation) show that people have long placed high value on the area's natural features; and
- Waterton-Glacier is the world's first international peace park.

Glacier National Park has been divided into six well-known geographic areas, each with its own management philosophy: Many Glacier, Goat Haunt-Belly River, the Going-to-the-Sun Road corridor, Two Medicine, Middle Fork, and North Fork (NPS 1999). The six geographic areas each contain up to four management zones: the visitor service zone, the day use zone, the rustic zone, and the backcountry zone. Each of the four management zones has a different set of desired resource conditions, visitor experiences, management activities, and development.

Impacts from the proposed projects may be widespread throughout the park, but the sites most directly affected would be those proximate to sites where helicopters would deliver materials, including Granite Park Chalet, Granite Park Patrol Cabin, and Apgar, Porcupine, Scalplock, and Swiftcurrent Lookouts. Most of these sites are located in the backcountry zone, although the day use, rustic, and visitor service zones may also be impacted by the proposed actions. Visitor use consists of hiking, horseback riding, and backcountry camping, and visitors are encouraged to practice "leave no trace" skills and ethics. Development is limited to trails, campsites, signs,

sanitation facilities, patrol cabins, and historic structures. Natural quiet predominates and visitors experience few encounters with other visitors.

Purpose and Need for the Project

During the course of a year, the National Park Service (NPS) uses on average 50 helicopter and fixed-wing flights to deliver supplies and materials to project sites in the backcountry and to perform maintenance on radio towers throughout the park. Since 1999 Glacier National Park has reviewed each proposed flight to determine the degree of effects on wildlife and visitor resources. Approximately 50 administrative flights are taken each year and NPS has determined that these do not have a measurable effect on park resources. Prior to 2003 about 33 flights were approved to occur in 2003 to complete a number of projects. However, in addition to those 33 flights, approximately 112 new flights have been proposed to accomplish needed projects. The 33 flights already approved have been reduced to 25 by combining two of the projects' flights. However the new 112 flights would have more than a measurable effect and need to be analyzed in an environmental assessment.

The proposed administrative flights would be used to accomplish the following projects:

1) Remove untreated human waste from Granite Park Chalet and Patrol Cabin.
2) Repair and maintain the radio systems at radio towers throughout the backcountry.
3) Rehabilitate Porcupine Lookout.
4) Monitor threatened and endangered wildlife species and species of concern.

These projects are needed to provide for visitor and employee safety and health, and to collect information to assist the park in conservation of wildlife species. The proposed helicopter and fixed-wing flights would accomplish these projects in a safe, timely and efficient manner. However, as stated above, the effects of this number of flights are of concern, thus this Environmental Assessment (EA) has been prepared.

Public Involvement

Public scoping was conducted in December 2002 by mailing out letters to individuals and agencies on the park's mailing list, asking for comments and concerns A press release was also issued. Four letters were received from members of the public stating concern about the number of proposed administrative flights over the park. Two comments urged the park to address a long-term solution for human waste at Granite Park. The State Historic Preservation Office stated that cultural resources would not be affected by the proposed flights.

Impact Topics

Based on the comments received during scoping and the park staff's analysis, the following impact topics were identified for evaluation:

Natural Soundscapes

Natural soundscapes are not always silent but include the sounds of running water, blowing wind, chattering birds, and many other sounds found in nature. Mechanical noises, such as those produced by aircraft, can drown out these natural sounds on a temporary or recurring basis. Therefore, natural soundscapes are included as an impact topic in this EA.

Threatened, Endangered and Sensitive Species
Threatened, endangered and sensitive species of wildlife are known to occur in areas that would be affected by the proposed flights. Like other wildlife, they could be disrupted or displaced from normal activities by these flights. Many listed species require monitoring as part of their Recovery Plans. Threatened, endangered, and sensitive species are therefore included as an impact topic in this EA. Bull trout, Spalding's campion, water howellia and Slender moonwort will not be affected by the proposed project. None of the projects are in water or located near these plants' habitats. Therefore they are not discussed any further.

Wildlife
Due to noise caused by aircraft, particularly helicopters, wildlife can be easily disturbed and may be displaced or disrupted from normal activities. Therefore, wildlife is included as an impact topic in this EA.

Vegetation
Helicopter landings have the potential to impact vegetation. Also, lack of toilets at the chalet and patrol cabin could impact vegetation. Therefore, vegetation is included as an impact topic in this EA.

Park Operations
The proposed flights impact the park's ability to perform maintenance on the Granite Chalet, Porcupine Lookout and the park's radio tower system, and monitoring of threatened, endangered, and proposed listed species in keeping with the Endangered Species Act and the NPS mission. Therefore, park operations are included as an impact topic in this EA.

Visitor Experience
The proposed projects could affect the visitor experience from a variety of standpoints. Many visitors are disturbed by the disruption of natural soundscapes caused by aircraft, as well as by the appearance of aircraft, particularly when they are in the backcountry zone, most of which is proposed wilderness. Visitors would be impacted if the facilities at the chalet were to shut down due to inability to maintain it. Visitors in need of search and rescue operations would be impacted if the radio communication system did not function properly. Therefore, visitor experience is included as an impact topic in this EA.

Proposed Wilderness
Approximately 95% of the park is identified as suitable for inclusion in the national wilderness preservation system. However, Congress has not formally designated any land in Glacier as wilderness. NPS policy requires that the proposed wilderness land in Glacier be managed as wilderness until such time as Congress either formally designates the land as wilderness or rejects the designation. The proposed flights could affect those values that led to over 95% of the park being identified as suitable for wilderness designation. Therefore, proposed wilderness is included as an impact topic.

Impact Topics Eliminated from Detailed Study

Air Quality
Aircraft can have negligible, localized, short-term adverse effects on air quality. However, no measurable impacts are expected, therefore this topic was dismissed as an impact topic.

Aquatic Species
Helicopters or planes would not be landing in or near enough to water to affect aquatic species, therefore, this topic was dismissed as an impact topic.

Cultural Resources
Cultural resources include archeological, ethnographic, and historic features. Although the Chalet is a national historic landmark and many of the park's lookouts are on the national register of historic places, the proposed flights would have no effect on these resources. Therefore, cultural resources were dismissed as an impact topic.

Environmental Justice
Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, requires all federal agencies to incorporate environmental justice into their mission. The preferred alternative would not have health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Environmental Guidance (1998). Therefore, environmental justice was dismissed as an impact topic.

Prime and Unique Farmlands
In 1980, the Council on Environmental Quality (CEQ) directed that Federal Agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) as prime or unique. There are no "prime or unique farmlands" in Glacier National Park; therefore this topic was dismissed as an impact topic.

Socioeconomic Resources
Although the proposed actions would provide employment opportunity for a few individuals for a short time period, there would not be any measurable impact on socioeconomics in the area, therefore socioeconomic environment was dismissed as an impact topic in this EA.

Soils
Although helicopters may land temporarily on soils for some projects, only negligible effects may occur. Therefore, soils were dismissed as an impact topic.

Water Resources, Wetlands, and Floodplains
No landings would occur in or near water and floodplains would not be obstructed, and the proposed flights would have no effect on water resources, wetlands, or floodplains. Therefore this topic was dismissed as an impact topic.

Wild and Scenic River
Flights may pass over the Wild and Scenic River corridor but would not affect the outstanding values for which the River was designated as a part of the Wild and Scenic river system due to the height at which they would cross over these rivers. No landings would occur within the Wild and Scenic River corridors. Therefore, it was dismissed as an impact topic. Impacts to visitors, including noise, within the wild and scenic river corridor will be addressed under visitor experience.

ALTERNATIVES INCLUDING THE PREFERRED ALTERNATIVE

This section describes the alternative actions. Development of alternatives resulted from discussion among park staff. Two alternatives were identified for further evaluation as part of the Environmental Assessment and are discussed below. The alternatives that were considered, but eliminated from detailed study are also briefly discussed.

Alternative A: Conduct Additional Administrative Helicopter and Fixed-Wing Flights in 2003 (Preferred Alternative)

Remove Untreated Human Waste from Toilets at Granite Park Chalet and Patrol Cabin (34 helicopter flights)

Untreated human waste would be removed from the biological mediation system unit (toilets) at Granite Park Chalet that is not functioning as planned. This would be accomplished by moving waste material to the side of the unit using shovels and racks, then moving this material out through the bottom side accesses. It would be shoveled into 55 gallon barrels approved for slinging under helicopters; and flown to the Logan Pit helispot. Barrels would be transported to and emptied into the park's sewage treatment facilities in West Glacier. Based on past history, each barrel, once full, weighs about 450 pounds. A total of 16 barrels would be removed from the site. Crews would be flown in and out of the site daily so they may shower and sanitize each day, as there are no shower facilities at the site. The duration of project could be up to four weeks depending on flying weather. There would be approximately 34 trips to move personnel up and back and human waste out of the area. These trips would begin in the spring of 2003, and must be accomplished before the start of the operating season for the concessionaire, which is scheduled for July 1, 2003. This process would be repeated every two to three years with current levels of use and capacity of facilities.

Additionally, in that area, an above ground composting toilet that was installed near the Granite Park Patrol Cabin about 10 years ago is in danger of failing. Snow load and snow creep has broken the outer wall on the toilet. The untreated human waste from this toilet would also be shoveled into 55-gallon drums and flown to Logan Pit, to be loaded onto a truck and transported to the park's sewage treatment facility in West Glacier. About 180 gallons of waste would be removed along with the toilet. Approximately 4 of the 34 helicopter flights would be made from Logan Pit to Granite Park Patrol Cabin and back for this part of the project. There would be no

landing at the cabin, and possibly only one landing at Logan Pit. These projects would occur at the same time.

Flight paths to the Granite Park Chalet and the Patrol Cabin would follow the preferred path in the Glacier National Park Aviation Management Plan (NPS 2000). The aircraft would depart from a commercial helicopter base outside the park in West Glacier and would fly up the Going-to-the-Sun Road corridor at 2,000 feet AGL. When it nears the chalet and cabin, it would leave the Road corridor and fly directly to the site. Once the barrels are full the helicopter would hover while the barrels are attached to the long line (approximately 100 feet long) at the chalet, cabin and Logan Pit. The helicopter would fly as direct a path as possible between the chalet and cabin and Logan Pit at as high an elevation as possible between locations. Helicopters would have to land to load and unload personnel at Granite Park Chalet and Logan Pit. This is a temporary solution to the toilet issue at the chalets, and the NPS realizes a long-term solution is needed.

Perform radio tower maintenance (6-8 or more helicopter flights)
Communications among park personnel is considered a life safety issue, so when the need arises, radio tower repairs, including replacing batteries, must be completed immediately. Based on past experience, radio tower repairs in 2003 would require at least 6-8 helicopter flights to Apgar, Scalplock and Swiftcurrent Lookouts (Figure 1). Preferred flight paths would be followed (NPS 2000). Although there is trail access to the lookouts, the helicopter would be used to drop off and pick up park personnel and equipment at a landing zone a short distance up-slope from Apgar Lookout for safety, speed and efficiency. Each project is likely to require one or two trips, depending on the type of repair needed. There is the potential for a greater number of flights if problems develop. All flights would originate from a commercial helicopter base outside the park in West Glacier.

The Apgar Lookout, elevation 5,236 feet, is located in the Middle Fork Geographic Area of the park (NPS 1999a). Flight distance from West Glacier to Apgar Lookout is approximately 3 miles, and the flight path would be over the Middle Fork of the Flathead River, lower McDonald Creek, and the southeast end of the Apgar Mountains. Total flight time is estimated to be 2 to 4 hours. The helicopter would land at Apgar Lookout to drop off maintenance personnel and equipment.

The Scalplock Lookout, elevation 6,919 feet, sits approximately 16 miles from Nyack Flats and 24 miles from West Glacier, and this flight would occur over the Middle Fork of the Flathead River and Scalplock Mountain. The Scalplock Lookout flight would be staged either at Nyack Flats or the West Glacier horse pasture. Flight distance from West Glacier to Nyack Flats is approximately 9 miles, and flight distance from this staging area to the lookout is approximately 2 miles; flight distance from the West Glacier horse pasture to the lookout is approximately 10 miles.

The Swiftcurrent Lookout is located within the Many Glacier and the Going-to-the-Sun Road Corridor Geographic Areas, in the central portion of the park. A large portion of these geographic areas lies above treeline along the Continental Divide. Elevations range from 3,100 feet at Lake McDonald to 8,436 feet at Swiftcurrent Lookout. Swiftcurrent Lookout sits at the summit of Swiftcurrent Mountain on the Continental Divide. Swiftcurrent Mountain is mostly above treeline and is comprised mainly of screefields, forbs, and lichen with limited shrub cover. Subalpine forest occurs at Swiftcurrent Pass (7,185 feet) and below. The flight distance from West Glacier to Swiftcurrent Lookout is approximately 22 miles.

The Park is required to upgrade the entire radio system in the near future, since the current radios do not meet Federal Communications Commission or Department of Interior narrow band digital standards. This would require an increase in the number of repeater sites, but not all would require air support. No change in the number and locations of proposed flights for 2003 is anticipated with this upgrade.

Rehabilitate Porcupine Lookout (30 helicopter flights)
The park's Cultural Resource Plan states that nine of the historic lookouts in the park would be maintained. Porcupine Lookout, in the Goat-Haunt-Belly River geographical region of the park, is among those to be rehabilitated. Helicopter flights would be conducted twice in early July, and once in mid September for delivering crews and supplies for rehabilitation of the Porcupine Lookout and trail, and for installation of radio equipment. The radio repeater is needed at Porcupine Lookout to allow Goat Haunt Ranger Station to communicate with park headquarters, which is considered a Homeland Security need. Once the lookout building is rehabilitated, the radio equipment would be stored in a weatherproof location and would require less maintenance than if it were in the open. The trail to Porcupine Lookout is not currently travelable, so work crews would be flown in.

Flight distance from West Glacier to the Goat Haunt Ranger Station is approximately 34 miles, and flight distance from this staging area to the lookout is approximately 2 miles. The flight path would begin at West Glacier, the helicopter would fly above 2,000 feet above ground level over McDonald Creek, Flattop Mountain, Waterton River, and would land at a flat area several hundred feet above the lookout to unload a crew to help with sling loads on the ground. The helicopter would proceed to Goat Haunt Ranger Station, where it would land to pick up the next crew. From Goat Haunt, the helicopter would travel approximately 3.5 miles southwest along the Waterton River valley, and would land at a flat site a few hundred feet above the Lookout to deliver the crew. Because of local winds, to gain enough altitude to get to the lookout the helicopter may need to swing out north over Upper Waterton Lake before heading south toward the lookout. The helicopter would return to Goat Haunt to carry sling loads up to Porcupine Lookout. Approximately 12 trips are estimated for each of the July work days, and approximately 6 trips for the September work day. Total flight time for the Porcupine Lookout work is estimated at 12-15 hours. Then the helicopter would return to West Glacier at an altitude above 2,000 feet AGL.

Wildlife Monitoring (30-40 fixed-wing flights) Fixed wing flights would be used to monitor bald eagles, bighorn sheep, bull trout, Canada lynx, gray wolves, grizzly bears, and wolverine.

Bald Eagle. Monitoring of the threatened bald eagle is a requirement of the *Pacific States Bald Eagle Recovery Plan* (USFWS 1986). Up to three fixed-wing aircraft flights are needed to monitor the early season nesting activity (occupancy) of bald eagles at nine of the twelve nest sites in or near the park. The other three nests can be monitored from roads. The nine nests that require aerial monitoring are located east and west of the Continental Divide in valley bottomlands ranging from 3,153 to 4,882 feet elevation. Ground monitoring of these nests is not feasible due to hazardous conditions created by avalanche conditions and spring ice breakup. In addition, ground monitoring would require up to a month of surveys. Bald eagle nests in the park are located in old-growth coniferous forests near rivers and lakes. Five to 10 hours of flight time

would be needed for up to 3 days between late March and early to mid-May, until backcountry nest sites can be more readily accessed by trail. The type of aircraft would be a Cessna 185, or similar craft. Each flight would last about 2-3 hours. Flight routes would be over lakes and rivers, and intervening ridges and passes. Most flight time would be at or above 2000 feet above ground level (AGL), but observation and data collection at each nest would require brief periods (1-2 minutes) where the flight is at or near 500' AGL. Over 20 years of monitoring bald eagle nests has provided Glacier National Park with the most complete population trend information on any species of wildlife in the park. These data not only contribute to recovery goals, but provide valuable information of interest to resource managers and the public, and for fulfilling the National Park Service mission.

Bighorn Sheep. Up to three fixed-wing flights may be conducted for the retrieval of GPS collars from bighorn sheep on the east side of the park, as part of a study of bighorn habitat use and behavior. The project would focus on the Many Glacier Valley, and low elevation radio flights may occur up to a ten-mile range from there. The aircraft would generally fly above 2,000' AGL, but may need to approach 500' AGL for brief periods. GPS collars are programmed to drop off on November 1. Since all of the animal location data is stored on the collar, loss of the collar would result in loss of all location data for that animal. No bighorn sheep monitoring flights are anticipated and would only be conducted in the unlikely event that ground-based telemetry is unable to locate the collar signal. Furthermore, if flights are deemed necessary, attempts would first be made to combine them with other wildlife monitoring flights. Data from the bighorn sheep study would be used to assist resource managers in assessing risks to the bighorn population.

Bull Trout. Monitoring of the threatened bull trout is a requirement of the recovery plan (USFWS 2002). Monitoring bull trout from the air would provide information on bull trout movements, spawning locations and mortality. Fixed-wing flights would be conducted each year for bull trout monitoring. Two to four flights would be scheduled around September during spawning. The park fisheries biologist would travel the mainstem St. Mary River from headwater areas in the park downstream to St. Mary Reservoir in Alberta, tracking approximately 25 radio-tagged fish on downstream and upstream legs of the flight. They would also search Boulder, Kennedy and Otatso Creeks, and Divide Creek if time permits. The plane would fly at about 650 feet AGL.

Canada Lynx. Up to six fixed-wing flights may be needed during October to locate radio-collared Canada lynx, as part of a study of lynx habitat use and dispersal. The project would focus on the Many Glacier, Cut Bank and Two Medicine drainages. The aircraft would generally fly above 2,000' AGL, but may need to approach 500' AGL for brief periods. Telemetry locations derived from these flights would supplement, and validate, more frequent locations from GPS transmitters (signals transmitted to satellites and not requiring monitoring flights), and would facilitate location of animals for the purpose of capture and replacement of transmitter collars with limited battery life. Overall data derived from the lynx study are intended to assist resource managers in perpetuating the population of this threatened species.

Gray Wolves. Monitoring of the threatened gray wolf is a requirement of the Northern Rocky Mountain Gray Wolf Recovery Plan (USFWS 1987). From one to five fixed-wing flights may be conducted to monitor radio-collared gray wolves. The number of flights depends on whether radio-collared wolves are present, and on cooperative monitoring from other agency personnel; during some years no park flights are required. Flight routes would be over the North and Middle

Fork drainages, along the west boundary of GNP. This is where three established wolf packs maintain territories; flights could occur in other areas of the park if new packs are discovered. Known wolf den sites have typically been located in old growth coniferous forests adjacent to water sources and meadows and are generally found at lower elevations. The aircraft would generally fly above 2,000' AGL, but would need to approach 500' AGL for brief periods of observation and data collection. Flights could occur in any month, but would most likely occur during the spring and summer. The purpose of these flights is to collect information on the location of wolf dens and rendezvous sites, production of pups, pack size, and other relevant information to allow the park to make management decisions based on the most current and reliable information. Some information is also provided to the public to enhance appreciation of the natural attributes of the park; information on wolves generates considerable interest.

The frequency of the flights would be limited to the minimum necessary for management purposes. Past research has indicated that fixed-wing flights are less intrusive to wolves than alternative ground locations that require a relatively close approach to obtain comparably accurate locations and counts. Research has also demonstrated that fixed-wing aircraft have less impact to wildlife than helicopters.

Grizzly Bears. Monitoring of the threatened grizzly bear is a requirement of the Grizzly Bear Recovery Plan (USFWS 1993). From one to five fixed-wing flights may be conducted each year to monitor management grizzly bears (bears captured for management purposes and fitted with radio collars). The number of flights depends on whether management bears are present, and on cooperative monitoring from other agency personnel; during some years no park flights are required. The aircraft would generally fly above 2,000' AGL, but would need to approach 500' AGL for brief periods of observation and data collection. These flights could potentially be park-wide and year-round, as movements and locations of bears are difficult to predict.

The purpose of these flights is to collect information on grizzly bear activity, mortality, and other information relevant to park management decisions. The frequency of the flights would be limited to the minimum necessary for management purposes. Past research has indicated that fixed-wing flights are less intrusive to grizzly bears than alternative ground locations that require a relatively close approach to obtain comparably accurate locations and counts. Research has also demonstrated that fixed-wing aircraft have less impact to wildlife than helicopters.

Wolverine. In support of a wolverine study that began in January 2003, monthly maintenance flights would occur from May through December 2003, all above 1,000 feet AGL. Given the propensity of wolverines to range over large areas, flights may be conducted throughout GNP, but would likely focus on the Many Glacier valley. Similar flight frequencies may be required during 2004. Performance and persistence of GPS transmitters (that utilize satellites and do not require flights) may permit the reduction or elimination of flights after 2003. Results of this study would help identify risk factors for wolverine. Fixed-wing flights for other purposes would be used to monitor wolverine, where appropriate, and telemetry flights for wolverine, lynx and bighorn sheep would be combined where possible.

Mitigation Measures

- Flights would maintain a distance of 2 km (1.2 mi) from known mountain goat cliffs.
- Known grizzly bear seasonal concentration areas, such as the army cutworm moth sites on several mountain peaks, or the Apgar Range, would be avoided from July through September when possible.
- Helicopters would follow suggested flight paths away from sensitive areas.
- Flights would occur between one hour after sunrise and one hour before sunset if possible.
- The helicopters would fly at a minimum of 500 feet AGL except when landing or taking off or when delivering supplies on a long-line.
- Fixed wing aircraft would fly at a minimum of 500 feet AGL except when it is necessary to fly lower to gather information on species under observation.
- A flight manager would be assigned to each project to insure that conditions are met, safety is observed and that threatened and endangered species activity is monitored.
- No flights would be conducted at times and places that may interfere with grizzly bear den construction (mid September-mid November and during emergence in April-May).
- Flight paths would be designated so as to avoid open alpine meadows (other than in winter), where grizzly bears that are present would not have access to cover. If a low-level flight or landing is needed in an alpine area, and a bear is seen, the flight may be postponed depending on the judgement of the flight manager.
- When wolf den locations are known for 2003, low level flights in those areas would be postponed until after the critical denning period. This would be coordinated though the park's wildlife biologist.
- A buffer zone of 0.25 miles would be maintained around bald eagle nests for all flights except those involved in monitoring. Eagle nests would not be surveyed aerially during inclement weather to avoid chilling of the young in case birds are forced from the nest.
- Eagles on nests would be allowed to see the aircraft approaching if possible.
- When possible, a larger helicopter would be used to reduce the number of flights needed. A larger helicopter would be used on two of the projects discussed under Cumulative Impacts that reduce the total number of helicopter trips already planned from 31 to 25.

Alternative B: No Action

Remove Untreated Human Waste from Toilets at Granite Park Chalet and Patrol Cabin

The No Action alternative would mean that untreated human waste would not be removed from Granite Park Chalet or Patrol Cabin in time for the 2003 summer season. The toilet systems would fail and would be closed. The chalet toilet is currently full, so beginning with the day use season in June, no collection facility would be available for guests, hikers, and employees. Visitors would disperse human waste over a wide area surrounding the Chalet and Patrol Cabin, as was done before construction of the toilet in 1994.

Perform Radio Tower Maintenance

The No Action alternative would mean that radio towers would not be repaired, and radio communications would be limited or nonexistent for some areas of the park. This would limit the park's ability to protect visitor and employee life and safety. Park employees would have to hike into the repeater sites where possible to perform repairs. Some repairs would not be possible resulting in some repeaters being removed from operation because the equipment needed would be too large to either hike or pack into the backcountry.

Rehabilitate Porcupine Lookout

The No Action alternative would mean that Porcupine Lookout would not be rehabilitated. The trail to the lookout is not currently useable; it would be two years or more before the trail was rehabilitated enough to get pack stock up to the lookout. By that time, funding for the project may no longer be available. In addition, if no flights were conducted in 2003, the radio system would not be installed, and Goat Haunt Ranger Station would not have communication with park headquarters.

Wildlife Monitoring Flights

The No Action alternative would mean that no flights would be conducted for monitoring of radio-tagged animals or for locating animals so that radio and GPS collars may be retrieved. While wildlife can be monitored from the ground, more time and staff would be required, and the expense and limitations of ground monitoring would limit the amount of accurate data that could be collected.

Without the use of fixed-wing aircraft, bald eagle nest surveys would be conducted from the ground, but the backcountry eagle nests are inaccessible from the ground during the early part of the nesting season (March-April).

Bull trout research could not be accomplished to the extent it has been in the past without the ability to monitor year-round movement from aircraft. Although monitoring of radio-tagged bull trout could be done on foot, access to many areas would require travel and overnight stays in remote areas of the park.

Monitoring of gray wolves and grizzly bears would be done from the ground. This would require increased personnel in the backcountry. Data collected from the ground would be less reliable and accurate than that collected from the air.

Flights for bighorn sheep research would only be conducted to retrieve radio collars if ground-based telemetry is unable to locate the collar signal. In this situation, if no flights were conducted, researchers would not be able to retrieve collars.

Under No Action, approximately 28 helicopter flights that have already been approved and gone through the analysis process would occur. These 28 flights have been reduced to approximately 22 flights. These flights would occur in two locations in the park. Approximately 20 flights would occur between the parking lot at Logan Pass and locations along the boardwalk trail to pick up materials left over from the rehabilitation of the boardwalk trail. These flights would occur over 2 ½ hours in one day. They would occur late in the summer or early fall. Two flights would occur from Logan Pass to Sperry Chalet to deposit and pick up supplies and equipment to rehabilitate the water intake system. This project was begun in 2002 and is scheduled to be completed in 2003. These flights would occur at the same time as the Logan Pass flights.

Alternatives Considered but Eliminated from Detailed Study

The park considered hauling waste from Granite Park Chalet using pack stock. The un-composted and untreated human waste material would be shoveled into containers for pack stock that would have to be specially designed and developed. Packing human waste via stock would risk a spill along a heavily used trail, and would expose workers and visitors to disease-causing agents. The number of animal trips required to haul the current amount of waste out is estimated at 40, plus 10 trips for supplies and materials. Since day use visitation begins in June, and snow conditions usually prevent entry of stock until late July, it would not be possible to accomplish the project in the required timeframe (before July 1), and waste would have to be packed out during the heavy visitor use season. Delaying opening of the chalet is not an option, as the concession has a very short operating season, and reservations are booked well in advance. In addition, the park considered having personnel remain at the chalet rather than being flown in and out each day. However, since the personnel would be working with untreated human waste, they would need adequate sanitizing shower facilities. There are no current shower facilities at Granite Park as there is not an approved or adequate waste water system or an operational water system. These systems, once approved by regulating authorities, would have to be engineered, installed, and activated.

The park also considered using a larger helicopter on some or all of these projects with the expectation that it would reduce the number of flights required.

Using a larger helicopter on the Rehabilitation of the Porcupine Lookout would reduce the number of supplies and materials flights by approximately 8 trips, but would require another helicopter to be used to transport the crews. Hiking the crews in was also considered, but was determined to be infeasible because there is no trail and the crews would be carrying equipment cross- country that would cause safety concerns. Using a larger helicopter would actually result in more flights for the Porcupine Rehabilitation Project than proposed. Therefore this alternative was rejected.

Consideration was also given to using a larger helicopter to remove waste from Granite Park. This was rejected for a number of reasons. A special rig has been built that attaches to the barrels and then attaches to the helicopter. A larger barrel would require a new hauling rig. Furthermore a larger barrel could not be handled by crew on the ground and would require mechanical

equipment to move it safely. Furthermore, the crews must be flown in and out each day so they can take showers and clean up after handling untreated human waste. A larger helicopter would not reduce the number of flights carrying crew.

The wildlife monitoring flights are conducted with fixed-wing aircraft and a larger aircraft would not reduce the number flights required.

Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that the "environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA Section 101:

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) assure for all generations safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- (4) preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- (5) achieve a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities; and
- (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

Alternative A, Conduct administrative helicopter and fixed-wing flights in 2003, would allow the park to safely and efficiently remove human waste from toilets at Granite Park Chalet and Patrol Cabin. This meets criteria 1, 2, 3, and 5 by preventing contamination of the area and minimizing employee exposure to pathogens by flying the waste out. Waste removal also would allow continued operation of the chalet, which meets criteria 2 and 4 by preserving historic use.

Flights to maintain radio towers and preserve communications throughout the park reduce risk to visitor and employee safety and provide a high standard of living; this meets criteria 2, 3, and 5. Rehabilitation of Porcupine Lookout would also enhance radio communications, and it would preserve historic use of the lookout, meeting criteria 2 and 4.

Wildlife monitoring flights meet criteria 1, 4, and 5 by collecting data that would be used to preserve natural resources.

Alternative B, the No Action alternative, would require a shutdown of the Granite Park Chalet to prevent sewage overflows, and would not meet criteria 1, 2, 3, 4, or 5. Alternative B would provide a risk to public health and safety, by not allowing timely and full repair of radio communication towers. Alternative B would not allow for adequate monitoring of federally listed species by fixed wing-aircraft. To meet monitoring requirements in their recovery plans,

monitoring would have to be conducted on foot in close proximity to the animals causing a greater level of disturbance to the animals, thus it would not meet criteria 4 well. As a result, Alternative B does not meet the six criteria as well as Alternative A.

After careful review of potential resource and visitor impacts and developing proposed mitigation for impacts to natural and cultural resources, the environmentally preferred alternative is Alternative A. Alternative A surpasses the No Action alternative in best realizing the full range of national environmental policy goals as stated in section 101 of the National Environmental Policy Act.

Table 1. Summary of Alternatives

Alternative A -- Preferred Alternative	**Alternative B – No Action**
• Waste would be removed from Granite Park Chalet and Patrol Cabin by helicopter; toilets would be open for visitors and employees. • Helicopter flights to radio towers would occur for maintenance of park communications. Communications parkwide would be maintained. • Porcupine Lookout would be rehabilitated, and a historic resource would be preserved. • Threatened and endangered species and wildlife species of concern would be monitored from fixed-wing aircraft and important data would be obtained.	• Waste would not be removed from Granite Park Chalet or Patrol Cabin; toilets would be closed. • Some radio towers would not be maintained, only those that could be accessed and repaired by hiking or packing in. Radio communications throughout the park would be limited. • Porcupine Lookout would not be rehabilitated, and a historic resource would be lost. • Threatened and endangered species and wildlife species of concern would not be monitored from the air. Ground monitoring would occur to a limited extent, but some data would not be obtained.

Table 2. Comparison of Impacts of Alternatives.

Resource	Alternative A—Preferred Alternative	Alternative B—No Action
Natural Soundscapes	Alternative A would produce moderate, localized, short-term adverse impacts on natural soundscapes due to introduced noise from aircraft into the backcountry. Proposed flights would contribute moderate, short-term, localized, adverse effects to the cumulative effects of other agency administrative flights, commercial flights, and other park projects in 2003.	Alternative B would have no effect on the natural soundscape. No cumulative effects on the natural soundscape are anticipated with Alternative B.
Threatened and Endangered Species and Species of Concern	Alternative A would have minor to moderate, short-term, site-specific to local, adverse effects to bald eagles, bighorn sheep, Canada lynx, gray wolves, and grizzly bears if individual animals flee from the aircraft, or are displaced from favorable foraging sites. There would be long-term, minor to moderate, regional beneficial impacts to listed species from fixed-wing flights as monitoring information is used to help conserve these species. Cumulative effects would be minor to moderate, localized, short-term and adverse due to additional flights and disturbance from other park projects temporarily displacing listed species.	Alternative B would have minor to moderate, long-term, regional adverse effects due to loss of monitoring information, and minor to moderate, local to regional, short-term, beneficial effects, due to a reduction in the number of flights, on threatened and endangered species and species of concern. Cumulative effects would be minor and adverse due to the park's inability to compare data with that of other agencies.
Wildlife	There would be minor to moderate, short-term, site-specific to localized, adverse effects to wildlife with Alternative A due to displacement from proposed helicopter and fixed-wing flights. Cumulative effects would be minor to moderate, short-term, localized and adverse due to temporary displacement of listed species.	Alternative B would have minor, short-term, site-specific, adverse effects on wildlife due to increased ground disturbance and increased risk of wildlife-human interactions. No cumulative effects to wildlife are anticipated from Alternative B.
Vegetation	Alternative A would have negligible, short-term adverse effects on vegetation due to helicopter landings. There would be no cumulative effects on vegetation.	Alternative B, No Action, would have minor, short-term adverse effects on vegetation due to trampling at Granite Park and wildlife monitoring areas. There would be no cumulative effects on vegetation.
Park Operations	There would be negligible, site specific, short-term, adverse impacts to park operations under Alternative A due to visitor displacement. There would be minor to moderate, long-term beneficial impacts locally and parkwide. No cumulative impacts to park operations are anticipated from Alternative A.	Alternative B would have minor to moderate, long-term adverse effects, both locally and parkwide, on park operations. No cumulative impacts to park operations are anticipated with Alternative B.

Resource	Alternative A—Preferred Alternative	Alternative B—No Action
Visitor Experience	Alternative A would have minor, short-term site-specific adverse impacts on visitor experience due to visitor displacement during helicopter landings and long-line transport of materials, noise, and use of mechanical equipment in remote wilderness and backcountry settings. There would be minor to moderate, long-term beneficial impacts due to continued function of the chalet toilet, continued radio communications, and collection of wildlife data for interpretive programs. Cumulative effects would be minor to moderate, short-term, localized adverse impacts due to additional flights and construction projects occurring simultaneously.	Alternative B would produce minor short-term and major long-term adverse impacts on visitor experiences due to increased risk of wildlife-human interactions, decreased radio communications, and decreased information on wildlife. No cumulative effects to visitor experience are anticipated with Alternative B.

AFFECTED ENVIRONMENT

Natural Soundscapes

An important part of the mission of the National Park Service is to preserve the natural soundscapes associated with national parks. Natural soundscapes are the unimpaired sounds of nature. They are an important resource and have intrinsic value as a part of the unique environment of Glacier National Park. Natural sounds of wind, water, animals and other natural phenomena predominate through most of Glacier. Natural sounds are low decibel background sounds mixed with the sounds of wildlife. Natural sounds include the rush of wind or water, the roar of a waterfall, the rustling of leaves, the rush of air over wings of a bird, the song of a bird, the call of an animal, and the buzz of an insect. Natural quiet exists when the sounds of these natural components of the park prevail.

Artificial noise in Glacier National Park originates from human activities and varies depending on time and location. Sources of noise in the park include road traffic along the Going-to-the-Sun Road and other roads in and around the park, motorboats in McDonald, Sherburne, St. Mary, Upper Waterton and Lower Two Medicine Lakes, scenic air tours over the park, railroad traffic along the southern edge of the park, activity in the developed areas of the park such as campgrounds and trails, and general maintenance and administrative activities (chainsaws, helicopter flights, emergency vehicle sirens). Elevated noise levels are generally concentrated in visitor service zones near campgrounds, lodges, roads, and developed areas. Noise from scenic air tours can be heard throughout the park. Current and future development outside the park, including mineral development, logging, and new construction, may also lead to increased noise within the park. The wilderness and backcountry areas of the Park are managed for natural quiet.

Threatened and Endangered Species and Species of Concern

There are five threatened or endangered terrestrial species listed by the U.S. Fish and Wildlife Service (USFWS) in Glacier National Park. They are the threatened bald eagle *(Haliaeetus leucocephalus)*, grizzly bear *(Ursus arctos)*, Canada lynx *(Lynx canadensis),* bull trout (*Salvelinus confluentus*), and gray wolf *(Canis lupus)*. The bald eagle, grizzly bear, Canada lynx, and gray wolf could occur in the proposed project areas. Bull trout are not considered to be affected by flights, so they are not described in this section.

Bald Eagle. Bald eagles use portions of Glacier National Park on a year-round basis as nesting and wintering residents (Yates 1989), and as seasonal migrants (McClelland et al. 1994, Yates et al. 2001). There are 11 known bald eagle breeding areas in the park, including five in the North Fork Valley, two in the Goat Haunt-Belly River area, one in the Middle Fork Valley, one at Lake McDonald, one at St. Mary Lake, and one in the Two Medicine Valley. There is another nest within 5 kilometers of the western park boundary in the North Fork Valley, and it is likely that these eagles forage inside the park as well. Documented spring and summer eagle activity in the Many Glacier Valley indicates there may be other resident bald eagles nesting near Sherburne Reservoir (NPS files). Glacier National Park is within a major bald eagle migration corridor (McClelland et al. 1994, Yates et al. 2001). During winter, some eagles remain to forage on Lake McDonald and along the Middle and North Forks of the Flathead River. A primary bald eagle and golden eagle migration route crosses the upper end of Lake McDonald.

The *Montana Bald Eagle Management Plan* (Montana Bald Eagle Working Group 1994), an extension of the *Pacific States Bald Eagle Recovery Plan* (USFWS 1986), provides general guidance and Glacier National Park's *Bald Eagle Operational Plan and Habitat Management Guidelines* (NPS 1999b) provides site-specific information and outlines habitat management actions for the protection and perpetuation of bald eagle use areas in the park.

Productivity of Glacier's nesting bald eagle population is considered low and is generally less than half that of the productivity documented for the rest of Montana (NPS 1999b). Glacier's productivity is also about half of that recommended in the *Pacific States Bald Eagle Recovery Plan* (USFWS 1986) for maintaining viable populations of nesting bald eagles. Reasons for lower productivity in the park may include severe winter and spring weather, deterioration of native fisheries (prey species), and human disturbance near nest and forage sites.

Nesting habitat characteristics include old-growth forest types near water, where eagles are afforded some seclusion from human activity. Vegetative screening provides much of the necessary seclusion for eagles near nest, roost, forage, and feeding areas (Caton et al. 1992). Bald eagle nesting sites occur primarily along the margins of lakes and along the larger rivers in the park. Nest areas are critical, and human activity or development may stimulate abandonment of the breeding area, affect successful completion of the nesting cycle, and reduce productivity. Designated nest areas extend within a 0.25-mile (400 m) radius of all nest sites that have been active within 5 years. The objectives of designating nest-site areas are to minimize human disturbance and to maintain or enhance nest-site habitat suitability.

Bald eagles are especially sensitive to human disturbance during the breeding period (Stalmaster 1978, Hamann et al. 1999). The breeding period includes courtship, late February to mid-April; egg laying and incubation, late March to late May; nestling, mid-May to early August, and fledging, early August to late September (least sensitive period). Effects of disturbance on breeding birds during incubation include short-term nest abandonment or nest desertion resulting

in exposure of the eggs to detrimental temperature extremes and predators (Hamann et al. 1999). Disturbance during rearing can result in trampling of young, young jumping or falling from nests before they can fly, and/or separation of young from parents. Chronic disturbance can cause nest abandonment. The potential for nest failure and nestling death due to human disturbance is reduced, but not eliminated, after nestlings reach an age of about 4 weeks (usually early to late June in GNP). Nestlings usually fledge at 10 to 12 weeks of age (by mid-Aug.), but young eagles do not migrate from breeding areas until sometime between mid-September and early October (McClelland et al. 1996). Outside of the breeding season, disturbance by humans may cause birds to change their feeding habits, thereby reducing normal food intake (Hamann et al. 1999).

There are no known bald eagle nest or roost sites near the Granite Park Chalet, nor near Scalplock, Swiftcurrent or Porcupine Lookouts. Use of these areas by foraging bald eagles has not been documented, and is likely minimal. There is a bald eagle night roost site near the Apgar Lookout that was documented during the autumn bald eagle & kokanee salmon concentration that collapsed in the early 1990s (Crenshaw 1985, Spencer et al 1990). This roost is probably used by a few eagles during the autumn and winter, and perhaps at other seasons. There are nests on Howe Ridge, near the upper end of Lake McDonald, and on the west shore of Upper Waterton Lake, approximately 1 mile north of Goat Haunt Ranger Station. Helicopter flights to the lookouts would stay ½ mile from the bald eagle nest, as recommended in Glacier National Park's *Bald Eagle Operational Plan and Habitat Management Guidelines* (NPS 1999b). Bull trout fixed-wing survey flights are not expected to occur in areas of bald eagle nests, though there may be occasional foraging birds along riverine flight routes. Bald eagle nest fixed-wing survey flights would obviously occur at nests. Fixed-wing survey flights for bighorn sheep, lynx or wolverine may potentially approach nest, roost or foraging sites, though bighorn habitat and wolverine denning habitat is typically distant from bald eagle nesting and foraging habitat. Lynx, wolf and grizzly bear habitat, however, does occur proximate to several bald eagle nests and foraging areas.

Gray Wolf. Historically common throughout the Rocky Mountains, gray wolves were present but greatly reduced by the time Glacier National Park was established in 1910. By the 1970s, wolf sightings were becoming more frequent in the North Fork of the Flathead River Valley and an effort was made to monitor wolf activity in and around Glacier National Park. In 1986 the first documented denning of wolves in the western United States in over 50 years occurred in the park (Ream et al. 1991). Wolves have continued to den in the park nearly every year since. Two separate wolf packs with a total of 10-33 wolves maintained home ranges in the North Fork throughout the 1990s. Recent sightings document two packs occupying the North Fork, each with at least 6 animals, and a third pack of unknown size in the Middle Fork area.

In addition to the resident North Fork packs, and possible Middle Fork pack, wolves have been reported in every major drainage in the park in recent years including the Many Glacier, McDonald, Cut Bank, St. Mary, Belly River, and Two Medicine Valleys (NPS files). Wolves denned in 1993 and 1994 in the Belly River area in Alberta, but there has been no verified denning activity east of the Continental Divide in Glacier National Park. Recent sightings and historic records for the east side of the park suggest that wolves are in the process of recolonizing the area. Pack activity has recently been observed in the St. Mary, Many Glacier and Belly River Valleys.

Gray wolves are wide-ranging and their distribution is tied primarily to that of their principal prey (deer, elk, and moose). Key components of wolf habitat are: 1) a sufficient, year-round prey

base of ungulates and alternate prey; 2) suitable and somewhat secluded denning and rendezvous sites; and 3) sufficient space with minimal exposure to humans (USFWS 1987). Low elevation river bottoms, or south-facing slopes that receive little snow, and are relatively free from human influence provide important winter range for ungulates and wolves. Known den sites are near these areas. Wolves are especially sensitive to disturbance from humans at den and rendezvous sites during the breeding period. Human activity near den sites can lead to pack displacement or physiological stress perhaps resulting in reproductive failure or pup mortality (Mech et al. 1991).

Management and recovery of wolves in the Northwest Montana Recovery Zone (of which Glacier National Park is a part) is directed by the *Northern Rocky Mountain Gray Wolf Recovery Plan* (USFWS 1987). The criteria for recovery of wolves in the western US is based upon the population goal of maintaining at least 10 reproducing packs within each of the 3 recovery zones for a period of 3 years. Inadequate prey densities and a high level of human persecution are the two most important factors limiting wolf distribution and preventing a complete recovery of wolf populations in the Northern Rocky Mountains (USFWS 1987). Glacier National Park's predominantly natural landscape contains some of the most secure and productive wolf habitat in the Northwest Montana Recovery Zone. Despite fluctuating wolf numbers since 1986, Glacier's established wolf population continues to serve as a source for natural recolonization in northwest Montana and southern Canada (Boyd-Heger 1997). Monitoring of gray wolf populations is crucial in order to meet the criteria for the recovery of wolves in the western US.

Grizzly Bear. Glacier National Park is part of the Northern Continental Divide Ecosystem (NCDE) recovery area for the threatened grizzly bear. Population estimates for this ecosystem vary between 549-813 bears (USFWS 1993). The NCDE is especially important for grizzly populations because it adjoins occupied grizzly bear habitat in Canada. Research during 1998-2000 identified 246 grizzly bears in Glacier National Park; however, many of these bears were also found in the areas surrounding the park (Stetz 2003). These preliminary results are from a recent study using non-invasively collected hair samples and DNA fingerprinting; detection rates suggested areas in the center of the Park had the highest concentrations of bears (Kendall and Waits 2002). Exact population estimates and trends are difficult to establish due to the lack of intensive population level research within this ecosystem and the inherent problems of counting the widely distributed and reclusive grizzly bear. The *Grizzly Bear Recovery Plan* (USFWS 1993) and the *Glacier National Park Bear Management Plan* (NPS 2001) serve as guidelines for management of grizzly bears in Glacier National Park. The plans outline actions that are required to protect and recover the federally listed grizzly bear.

Grizzly bear habitat is found throughout the park and ranges from the lowest valley bottoms to the summits of the highest peaks. Grizzly bears require large areas of undeveloped habitat (including a mixture of forests, moist meadows, grasslands, riparian, and alpine habitats) and have home ranges of 130 to 1,300 square kilometers (USFWS 1993). A radio-collared female grizzly, with cubs, was documented using 220 square kilometers as a home range in 1998 and 1999 in the McDonald Valley of Glacier National Park (NPS files).

Grizzly bear seasonal movements and habitat use are tied to the availability of different food sources. In spring, grizzly bears feed on dead ungulates and early greening herbaceous vegetation at lower elevations (Martinka 1972), including the south aspect of Altyn Peak in the Many Glacier Valley and the southeast aspect of the Glacier Wall in the McDonald Valley. Mating bears may be found at higher elevation sites during late May and June. During the summer, typically from July until September, some bears move to higher elevation alpine

meadows in search of glacier lilies and other roots, berries, and army cutworm moths (*Euxoa auxiliaris*). Some peaks have been identified as important cutworm moth feeding sites, though there are likely additional undocumented moth feeding sites. During the huckleberry (*Vaccinium* spp.) season (late summer and fall), bears often concentrate in the Apgar Mountains, Belton Hills, Snyder Ridge, the Many Glacier Valley, the Two Medicine Valley, and other areas. Avalanche chutes provide an important source of herbaceous forage for grizzly bears in the early summer and fall (Rockwell 1995). During the winter, grizzly bears hibernate in dens away from human disturbance, typically at higher elevations on steep slopes where wind and topography cause an accumulation of deep snow. The denning season in the western portion of the NCDE usually begins in early October, with a few bears remaining active until December, or rarely later. Bears emerge from dens as early as March, usually staying near dens for several days to over a week, and some late-emerging females may linger near dens until late May (Mace and Waller 1997).

Glacier National Park was placed into grizzly bear management situations in accordance with the Grizzly Bear Recovery Plan (USFWS 1993). Over 1 million acres of the Park (proposed wilderness) are established as Management Situation 1, in which management decisions would favor the needs of the grizzly bear when grizzly habitat and other land-use values compete, and grizzly-human conflicts would be resolved in favor of grizzlies, unless a bear is determined to be a nuisance. Maintenance and improvement of grizzly bear habitat and grizzly-human conflict minimization would receive the highest management priority in these areas. The remainder of the Park, which is developed front-country, is established as Management Situation 3, in which grizzly habitat maintenance and improvement are not the highest management considerations, grizzly bear presence would be actively discouraged, and any grizzly involved in a grizzly-human conflict may be controlled.

Riparian areas, avalanche chutes and shrubfields within the McDonald Creek and Middle Fork of the Flathead River Valleys are highly suitable spring grizzly bear habitat. It is expected that grizzly bears use the upper elevations of both geographic areas for denning, although few known den sites have been documented. A search of GNP's grizzly bear sightings database reveals that hundreds of grizzly bear observations have occurred within each geographic area, including sightings of both grizzly bear family groups (females with young) and individual bears (NPS files).

The Granite Park area has high seasonal concentrations of grizzly bears (NPS files). Sightings during May and June may represent bears newly emerged from dens, or pairs that use higher elevation, snow-covered areas for mating. The area provides relatively little foraging opportunity until July, with most documented use occurring from early July to mid-September. There are no ungulate wintering areas or avalanche chutes nearby that provide carrion. Grizzly bears may make greater use of the area in early July during a low snowfall year. The chalet is located within grizzly bear Management Situation 3. It should be noted that sighting data provides general information on the relative concentration of bears in some areas, but is biased by the distribution and concentration of people, and by vegetative cover (sightability), and other factors, and thus can not be used to infer lack of bear use in areas with few or no sightings. Sightings must be used with an understanding of the inherent limitations, but in combination with the best available scientific research on grizzly bear distribution, it can provide certain insights. Preliminary results from an extensive sampling effort support general assumptions based on sightings, such as the

high concentration of bears in the Granite Park area, but further illustrate that grizzlies are widely distributed throughout the Park (Kendall and Waits 2002, USGS 2002).

Apgar Lookout is located in the Apgar Mountains, which may be closed to human use in late summer and early fall, when grizzly bears congregate to feed on huckleberries (GNP 2001, Kendall 1986). Scalplock Lookout is located near the southern tip of the park. Grizzly bears also occupy this area (Waller 2002, USGS 2002). Both lookouts are located in Management Situation 1 grizzly bear habitat.

Swiftcurrent Lookout, one mile north of the Granite Park Chalet, is also situated within Management Situation 1 grizzly bear habitat. The lookout straddles two BMUs: Upper McDonald and Swiftcurrent. Ridges and hanging valleys surrounding the lookout are highly suitable spring, summer, and fall grizzly bear habitat. It is also expected that grizzly bears use the upper elevations of the geographic area for denning, although there are no known den sites. Sightings of both grizzly bear family groups (females with young) and individual bears are common in these geographic areas (NPS files). Results of a 3-year, park-wide bear DNA study also suggest that the density of grizzly bears is relatively high in this area (USGS 2002).

Porcupine Lookout is located in a remote area with limited trail access, and therefore limited human disturbance. Grizzly bears forage in the alpine meadows in this area during late summer and fall; recent grizzly bear sign was found near the lookout in August 2002. Since there is a lack of cover in alpine areas, aircraft overflights are likely to cause bears in these areas to flee (Waller 2002, Klein 1974, Harding and Nagy 1980). The recommended flight path to Porcupine Lookout would be along the Waterton River valley, avoiding alpine meadows along Porcupine Ridge.

Canada Lynx. Lynx (*Lynx canadensis*) habitat generally is described as climax boreal forest with a dense undercover of thickets and windfalls (Ruediger et al. 2000). Advanced successional stages of forests and dense conifer stands often are preferred habitats of lynx for denning and foraging respectively. Lynx generally forage in young conifer forests especially where their primary prey, snowshoe hare (*Lepus americanus*), is abundant. Ongoing research in Montana (J. Squires, pers. comm.) has documented the importance of mature high elevation spruce-fir forests to lynx. They not only provide denning habitat but also foraging habitat with stable and relatively high densities of snowshoe hares. Other prey includes squirrels, grouse, martens, and voles. Lynx are most susceptible to disturbance during the denning period and while newborns are developing (April–August; Claar et al. 1999).

The Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000) identifies seventeen risk factors that could adversely affect lynx mortality, productivity and movements. Within Glacier National Park, the primary risk factors for lynx are: wildland fire management policies that preclude natural disturbance processes, roads and highways, winter recreational trails, habitat degradation by non-native invasive plant species, incidental or illegal shooting and trapping, competition or predation as influenced by human activities, and human developments that degrade and fragment lynx habitat.

The National Park Service is currently in the process of crafting a Conservation Agreement for Canada Lynx with the U.S. Fish and Wildlife Service. Approximately 55% of Glacier National Park is covered by deciduous and coniferous forests, but an unknown percentage of forested habitats qualify as potential Canada lynx habitat (NPS files). Although the National Park Service has not yet signed the Canada Lynx Conservation Agreement (USFS and USFWS 2000), Glacier

National Park considers the recommendations in the Canada Lynx Conservation Assessment and Strategy (Reudiger et al. 2000) prior to undertaking any new activities in lynx habitat.

Historically, lynx were considered "more or less common" throughout the area of Glacier National Park (Bailey and Bailey 1918). Documented sightings declined during the 1970s and 1980s and have increased in recent years (NPS files); however, sightings may not be particularly sensitive to population changes and should be interpreted with caution. Systematic lynx surveys involving snow tracking and DNA sampling were initiated in 1994 and 1999 respectively; lynx were detected in many drainages throughout the park including the St. Mary, Two Medicine, McDonald and Many Glacier Valleys, although no estimates of population numbers nor trend were attempted. Winter snow track surveys in 2002 detected lynx at Park Creek, Soldier Pass and Scalplock Mountain. In addition, remote camera stations and winter tracking have provided documentation of family groups in the Many Glacier and Two Medicine Valleys. Until this year, no intensive research documenting lynx distribution and movements has been undertaken in the park, thus information for the basis of this evaluation is limited.

Species of Concern. Species of concern to Glacier National Park are those species that are rare, endemic, disjunct, vulnerable to extirpation, in need of further research, or likely to become threatened or endangered if limiting factors are not reversed. Likewise, a species may be of concern because of characteristics that make them particularly sensitive to human activities or natural events. In addition, species of concern may also include big game, upland game birds, waterfowl, carnivores, predators, and furbearers whose populations are protected in the park but subject to hunting and trapping outside of the park. Species of concern in the project area include the fisher, wolverine, Rocky Mountain bighorn sheep, northern goshawk, golden eagle, harlequin duck, common loon, pileated woodpecker, Clark's nutcracker, Barrow's goldeneye. Information is presented below on bighorn sheep, wolverine and golden eagles. Other species of concern would either be unaffected by flights, or effects cannot be predicted due to lack of information.

Rocky Mountain Bighorn Sheep. Habitats required by bighorn sheep include high elevation open forest and grassland mosaic conditions. Conifer encroachment in subalpine and alpine meadows due to fire suppression has likely affected bighorn sheep use of these habitats in the park. Existing development in the park has resulted in habitat fragmentation and human disturbance. Human disturbance during sensitive periods such as lambing, rutting, transitioning between seasonal ranges, and wintering has undoubtedly had a widespread effect on bighorn sheep in the park. Bighorn may be found near the Swiftcurrent and Porcupine Lookouts, and near both chalets. Bighorn sheep are relatively sensitive to being approached by low level aircraft. In California, desert-dwelling sheep had severe reactions to approaching helicopters, but these animals were captured using nets fired from a helicopter (Bleich et al. 1990). At Grand Canyon National Park, in an area traveled frequently by helicopters, helicopter overflights altered the foraging behavior and caused a notable reduction in the foraging efficiency of desert bighorn sheep (Stockwell et al. 1991). In a study of bighorn sheep in Yellowstone National park, Ostovar (1998) found helicopters to be the most disturbing human activity (based on overt reactions). Dall sheep in the Yukon ran from helicopters, even at distances of 3 km (Frid 1998).

Wolverine. Habitats required by wolverines include forest mosaic and subalpine talus sites in cirque basins. Because wolverine home ranges can be over 900 km^2, large areas of protected, contiguous habitat are necessary to ensure viable, self-sustaining populations of these species. Wolverine denning areas are generally found near treeline. Greatest vulnerability is during the denning period from approximately March through June. Based on information gathered during

track surveys from 1998-2002, wolverines appear to travel widely throughout the Swiftcurrent, McDonald Creek and Middle Fork drainages in winter in search of ungulate carrion. Wolverine tracks occurred across a wide range of elevations, 3,290-6,920 ft west of the Continental Divide, and 4,780-7,680 ft east of the Divide. Wolverine sightings are spread across the park, with highest concentrations in the Many Glacier and Logan Pass areas (NPS files). Activities that would negatively affect wolverine include disturbance at den sites during the spring, displacement of wintering ungulates, the fragmentation of wildlife movement corridors, or altered visitor use patterns.

Golden Eagle. Habitats preferred by golden eagles include open terrain, especially alpine and lower elevation grasslands, cliffs, and open forest. Golden eagle nesting areas occur throughout the park, though most known nest sites are on the east side of the park. A nest located ¾ mile southeast of Porcupine Lookout was occupied in 1990, but there are no records of recent use (no recent surveys have been conducted).

Wildlife

Over 300 species of terrestrial wildlife species occupy Glacier National Park, either seasonally or year-round. The vegetation on site serves as wildlife habitat. Of particular significance to many species of wildlife are riparian areas, travel routes, avalanche chutes, shrubfields, wetlands, meadows, bogs, snags, recently burned areas, aspen parklands, old-growth forests, floodplains, mineral licks, nesting colonies, birthing grounds, hibernacula, den sites, ecotonal areas, roosts, caves, and cliffs. The proposed flights could occur over almost any area of the park.

The area around Granite Park Chalet contains habitat for black bears, wolverine, mountain lion, lynx and marten.

Year-round habitat for many species can be found in the McDonald Valley, including moose, elk, mule and white-tailed deer, gray wolves, black and grizzly bear, cougar, lynx, fisher, wolverine, and marten. Ungulate winter range occurs at Lake McDonald and along the Middle Fork of the Flathead River. The McDonald Valley contains nesting habitat for bald eagles, golden eagles, osprey, pileated woodpeckers and barred owls. A major wildlife corridor exists between Apgar and West Glacier. Black bears, grizzly bears, elk, deer, mountain lion, fisher and pine marten have all been observed in this area. Elk use the Apgar area in spring for calving and foraging.

The St. Mary Valley provides excellent forage and cover for a variety of wildlife species, including grizzly and black bears, mountain lions, lynx, wolverine, coyotes, gray wolves, bald and golden eagles, fisher, marten, and all six ungulate species found in the park. The east side of the park provides excellent winter range for bighorn sheep and mountain goats, especially in the Rising Sun area. The St. Mary Valley contains important elk wintering and spring calving areas.

The Many Glacier area contains outstanding year-round habitat for a myriad of wildlife species. The drainage contains important winter and spring range for bighorn sheep as well as lambing and rutting grounds. This remote area has relatively low levels of human activities.

The North Fork area provides important winter range for most ungulate species in the park, and contains habitat for gray wolves, grizzly bears, black bears, mountain lions, bobcats, coyotes and lynx. In the remote Middle Fork area, the Walton mineral lick is used by mountain goats, and the Belton Hills contain important winter range for deer and elk.

Most animals that are radio collared become habituated to aircraft overflights (Meier 2002). Some species are more tolerant than others; wolves in northwest Montana appear unconcerned about aircraft, while bighorn sheep exhibit flight response from a greater distance than most other animals. Few responses have been noted in Glacier Park and northwest Montana when aircraft were a minimum of 500 feet from animals (Meier 2002). Helicopters that approach mountain goats within 2 km can cause them to be displaced or become severely injured (Cote 1996).

Vegetation

The park represents a convergence of species representing four major floristic provinces. Contributing influences for this diversity include the contrast between the climates of the east and west sides of the Continental Divide, sharp topographic relief, and variability in soils characteristics. Over 1,132 vascular plant species have been recorded (Lesica 2002). Of these, 67 are rare in Montana.

The major vegetative community types in the park consist of grasslands (dry herbaceous), pine or woodland savannahs (open, dry coniferous and deciduous), bottomland forests (mesic herbaceous and deciduous), ponderosa pine/Douglas fir forests (open, dry coniferous), western red cedar/western hemlock forests (dense, mesic coniferous), spruce/fir forests (dense, mesic coniferous), and alpine communities (mesic herbaceous and barren). Also included are marshes, swamps, lakes, and barren, rocky talus slopes (Habeck 1970).

Forests cover two-thirds of Glacier National Park's land area. Lodgepole pine is widespread at lower and intermediate elevations, together with western larch and some western white pine on the west side of the park. The Lake McDonald area supports western red cedar and western hemlock, with spruce, Douglas-fir, and subalpine fir also occurring on the west side. Ponderosa pine occurs near Polebridge. Near the eastern park boundary, lodgepole pine intergrades with a mix of prairie community, aspen groves, limber pine, and Douglas fir. This area is prime habitat for elk, deer, and other wildlife species (Finklin 1986).

The integrity of the park's plant communities remains largely intact. However, some communities have been affected by human activities, such as introductions of exotic species, resource extraction, land development, and fire exclusion.

Helicopter landings would occur at Granite Park Chalet, Logan Pit, West Glacier, Apgar Lookout, Goat Haunt Ranger Station, and Porcupine Lookout. Granite Park is named for the profuse outcroppings of exposed igneous rock; the helicopter landing areas at the chalet and at Porcupine Lookout are rock. Logan Pit and Goat Haunt Ranger Station helicopter landing areas are gravel. The designated helicopter landing area at park headquarters in West Glacier is a fenced grass pasture used as a sprayfield. The landing area at Apgar Lookout is vegetated with grass, beargrass and shrubs.

Park Operations

The Granite Park Chalet provides overnight accommodations for visitors, and toilet facilities for day use visitors. The chalets are further described in the Visitor Experience section.

The Granite Park Patrol Cabin is located ½ mile northwest of Granite Park Chalet, at an elevation of approximately 6,500 feet. The cabin houses trail workers and rangers throughout the

summer months. The toilet there provides waste disposal to prevent human waste from impacting the surrounding area.

Radio communications are vital to park visitor safety and homeland security. Radio equipment at towers must be maintained in order to provide for continuity of radio communications throughout the park. The lookouts provide shelter for park employees who monitor fire starts in the park, and they house radio equipment that provides communications throughout the park for safety of visitors and employees.

Park managers rely on accurate, complete wildlife monitoring data to plan projects that minimize impacts to wildlife, and to plan conservation efforts for threatened and endangered species and species of concern.

Visitor Experience

In recent years, visitation to Glacier National Park has ranged between 1.7 and 1.8 million. The highest recorded visitation of 2,204,131 was in 1983. The overall trend indicates increasing visitation. Overnight visitation in Glacier has averaged about 28,000 camper use nights each of the last ten years. Backcountry day use figures are just above 150,000 people parkwide. The upper McDonald area receives over 25% of the day use visitation. Most of the visitation to this area happens between July 1st and September 15th.

Visitor experiences in the backcountry and wilderness areas of the park are characterized by predominately pristine natural conditions. There are some primitive facilities such as trails, bridges, campsites and administrative cabins and lookouts. Visitors look to these areas for outstanding opportunities for solitude, natural quiet, and primitive or unconfined types of recreation.

Backcountry and wilderness areas are managed to maintain and protect wilderness values and experiences. Each year from one to three large search and rescue operations requiring helicopter flights are conducted. From 1996 to 2002, from 3 to 25 hours of helicopter flight time per year (average 8.5 hours per year) were needed for search and rescue operations (NPS files). Search and rescue flights have been conducted at many different locations throughout the park, including retrieving climbers from alpine locations, and evacuating visitors from Granite Park Chalet, the Logan Pass area, the Two Medicine area, and the North Fork of the Flathead River, among other locations. In these instances, radio contact is essential to provide for visitor safety.

The Granite Park Chalet is a designated national historic landmark. Granite Park Chalet is located on an open hillside near Swiftcurrent Pass at an elevation of 6,640 feet, about 4 miles up the Loop Trail off the Going-to-the-Sun Road and 7.6 miles from Logan Pass on the Highline Trail. It is located within the western portion of the Going-to-the-Sun Geographic Area (NPS 1999a), and is accessible only by foot or horseback. The Chalet can accommodate up to 35 overnight visitors and is a popular lunch stop for day-hikers and horseback riders. The main building contains a dining room and employee and guestrooms. A second building has storage and employee housing. There is a restroom building with a double vault composting toilet. In 2002, 2,063 people stayed overnight at the Chalet during its July-September operating season, with the majority in July and August. Flight distance from West Glacier to Logan Pit is approximately 21 miles, and from Logan Pit to Granite Park is approximately 4 miles.

ENVIRONMENTAL CONSEQUENCES

The effects of each alternative are assessed for direct, indirect, and cumulative impacts on selected natural and cultural resources and other issues. Impacts are described in terms of intensity (negligible, minor, moderate, or major), context (site specific, local, and/or regional effects), duration (short-term or long-term), and type (adverse, beneficial). The thresholds of change for intensity of an impact are defined in Table 3.

Impacts to federally listed threatened and endangered species have been described in accordance with the Endangered Species Act.

The Council of Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment," which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7). Cumulative impacts are considered for all three alternatives.

The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that would harm the integrity of the park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. An impact would be more likely to constitute impairment to the extent it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified as a goal in the park's general management plan (NPS 1999a) or other relevant NPS planning document.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating the park. A determination on impairment is made in the *Environmental Consequences* section for each impact topic.

Cumulative Impacts

Cumulative impacts are determined by combining the impacts of the preferred alternative with other past, present, and reasonably foreseeable future actions. Therefore it was necessary to identify other ongoing or reasonably foreseeable future actions within Glacier National Park and, if applicable, the surrounding region. The following is a list of past, present and reasonably foreseeable future actions that could add to the impacts of the proposed actions over the affected area.

- Varying numbers of administrative flights have occurred annually for many years.
- Transport 100,000 lbs. of material by helicopter to Hidden Lake trail for boardwalk reconstruction at Logan Pass in late summer 2003. (Approximately 20 flights approved for a total flying time of 2-1/2 hours).
- Completion of Rehabilitation of Sperry Water Intake Project, late summer 2003. (4-8 flights approved that would be reduced to 2 by combining them with the Logan Pass boardwalk trail project).
- Emergency flights for search and rescue, road plowing and fire operations.
- Higher altitude commercial helicopter and fixed-wing tour flights.
- Flights by outside agencies for research purposes.
- Apgar wastewater system rehabilitation. (no flights needed)
- Apgar water system rehabilitation. (no flights needed)
- Many Glacier Hotel reconstruction (spring and fall). (no flights needed)
- Belton Bridge reconstruction. (no flights needed)
- Going-to-the-Sun Road construction (3 flights in 2003).
- Proposed inholder access path construction near Lake McDonald Lodge. (no flights needed)
- Rehabilitation of numerous park buildings. (No flights needed).

Table 3. Impact Threshold Definitions

Impact Topic	Negligible	Minor	Moderate	Major	Duration
Natural Soundscapes	There would be no introductions of artificial noise into the park.	An introduction of artificial noise would occur at localized sites. The effect would be readily detectable, but would not adversely affect park visitors or wildlife.	A widespread or localized introduction of noise would be readily detectable and would adversely affect nearby visitors and wildlife.	An introduction of noise would occur that would adversely affect visitors and wildlife.	Short-term – Effects extend only through the duration of the proposed project Long-term – Effects extend beyond the period of the proposed project
Threatened and Endangered Species and Species of Concern	No federally listed species would be affected or the alternative would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with a "no effect" determination in U.S. Fish and Wildlife Service terms.	The alternative would affect an individual(s) of a listed species or its critical habitat, but the change would be small. Minor effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "not likely to adversely affect" the species.	An individual or population of a listed species, or its critical habitat would be noticeably affected. The effect could have some consequence to the individual, population, or habitat. Moderate effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely…" or "not likely to adversely affect" the species.	An individual or population of a listed species, or its critical habitat, would be noticeably affected with a vital consequence to the individual, population, or habitat. Major effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely…" or "not likely to adversely affect" the species or critical habitat.	Short-term – Plants and animals recover in less than 1 year Long-term – Takes more than 1 year for plants and animals to recover

Impact Topic	Negligible	Minor	Moderate	Major	Duration
Wildlife	Wildlife would not be affected or the effects would be at or below the level of detection, and the changes would be so slight that they would not be of any measurable or perceptible consequence to the wildlife species' population.	Effects to wildlife would be detectable, although the effects would be localized, and would be small and of little consequence to the species' population.	Effects to wildlife would be readily detectable and localized, with consequences at the population level.	Effects to wildlife would be obvious, and would have substantial consequences to wildlife populations in the region.	Short-term - Recovers in less than 1 year Long-term - Takes more than 1 year to recover
Vegetation	Vegetation would not be affected or individual plants could be slightly affected; effects limited to a small area.	Changes would be localized, and affect one or more species populations.	A large segment of one or more species populations would be affected over a relatively large area.	Considerable effects on plant populations over large areas.	Short term—Effects last less than 3 years. Long term—Effects last more than 3 years.
Park Operations	Park operations would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on park operations.	The effect would be detectable, but would be of a magnitude that would not have an appreciable effect on park operations.	The effects would be readily apparent, and would result in a substantial change in park operations in a manner noticeable to staff and to the public.	The effects would be readily apparent, and would result in a substantial change in park operation in a manner noticeable to staff and the pubic and be markedly different from existing operations.	Short-term - Effects lasting for the duration of the treatment action Long-term - Effects lasting longer than the duration of the treatment action
Visitor Experience	Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.	Changes in visitor use and/or experience would be detectable, although the changes would be slight. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.	Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the effects associated with the alternative.	Changes in visitor use and/or experience would be readily apparent and have important consequences. The visitor would be aware of the effects associated with the alternative.	Short-term - occurs only during the treatment action Long-term - occurs after the treatment action

Methodology

Current natural and cultural resource conditions were assessed through consultation with Glacier National Park staff including the ecologist, wildlife biologist, restoration biologist, air and water quality specialist, biological technicians, telecommunications specialist, utility systems supervisor, wilderness coordinator, and compliance coordinator. Park files, other compliance documents and consultation with regional National Park Service staff were also used in analysis. Alternatives were evaluated on the basis of data and other information gathered from the following sources: databases (including GNP inventory, monitoring, and sighting databases as well as databases acquired from USGS scientists, universities, and independent researchers); Geographic Information System (GIS) thematic layers, interviews with technical experts, monitoring reports and current literature reviews. Data from recent field surveys was used along with information from other compliance documents. No federal or state listed plant species, wetlands or noxious weeds were found in the chalet area during restoration work. Wildlife monitoring included reports of wildlife sightings from visitors and employees, winter snow track surveys, radio collar tracking data, remote camera data, and genetic analysis of scat and hair. Impacts on threatened and endangered species are analyzed using informal consultation with the U.S. Fish and Wildlife Service.

Natural Soundscapes

Alternative A: Conduct Additional Administrative Helicopter and Fixed-Wing Flights in 2003 (Preferred alternative)

Impact Analysis: Alternative A would introduce artificial noise from 25 days of helicopters and fixed-wing aircraft that would adversely affect park visitors and wildlife in localized areas for short periods during those days. Most of the flights are scheduled to occur in June, prior to increased visitor use in the backcountry of the park. Landing of helicopters or conducting long line operations in or near proposed wilderness or backcountry areas would have moderate adverse effects for short periods to the immediate area as many wildlife species that produce natural sounds would be dispersed from the area**.** Visitors would be impacted mainly during the summer visitation season, and effects would be localized and short-term.

Cumulative Impact Analysis: Helicopters, and to a lesser extent fixed-wing, flights over the wilderness and backcountry areas would add to the already increasing sound of human activities. The proposed flights would add to the effects of already approved flights to Logan Pass for boardwalk rehabilitation, flights to Sperry Chalet to complete the water intake project, emergency flights for search and rescue or fire operations, outside agency administrative flights, and commercial flights occurring over Glacier National Park in 2003. Flights would also add to the noise of individual park projects including work at Apgar, Many Glacier, and Belton Bridge, but effects would be localized and short-term. Cumulative effects would be moderate, short-term, localized adverse effects to natural soundscapes.

Conclusion: Alternative A would produce moderate, localized, short-term adverse impacts on natural soundscapes due to introduced noise from aircraft into the backcountry. Proposed flights would contribute moderate short-term localized adverse

effects to the cumulative effects of other agency administrative flights, commercial flights, and other park projects in 2003.

Alternative A would not produce major impacts on natural soundscapes whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents, therefore there would be no impairment of natural soundscapes with Alternative A.

Alternative B: (No Action)

Impact Analysis: No additional flights would result in no additional impacts to the natural soundscape.

Cumulative Impact Analysis: There would be no cumulative impacts to the natural soundscape.

Conclusion: There would be no impacts, including cumulative impacts to the natural soundscape with Alternative B.

Alternative B would not produce major adverse impacts on natural soundscapes whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of natural soundscapes as a result of the implementation of Alternative B.

Threatened and Endangered Species and Species of Concern

Alternative A: Conduct Additional Administrative Helicopter and Fixed-Wing Flights in 2003 (Preferred alternative)

Impact Analysis: Grizzly bears, bald eagles, Canada lynx and gray wolves could be displaced by low elevation flights. This could cause them to expend energy fleeing an area where they were foraging, nesting, resting, or denning. There would be no effect to most species of concern. However, bighorn sheep are particularly susceptible to helicopter flights (Stockwell et al. 1991, Ostovar 1998, and Frid 1998); thus, care would be taken to avoid known bighorn sheep ranges during all flights. Fixed-wing flights do not appear to disturb eagles or other raptors; low helicopter flights could disturb nesting golden eagles, but no decline in productivity of raptors has been documented due to effects of helicopter or fixed-wing overflights (Grubb and King 1991, Carrier and Melquist 1976, Sprunt et al. 1973, White and Sherrod 1973).

Bald eagle nests have been monitored nationwide for over two decades using helicopters and fixed-wing aircraft with no apparent long-term impact. Fixed-wing aircraft were chosen to survey nests in Glacier due to the greater likelihood of disturbing backcountry users, bald eagles, and other wildlife with helicopters. Research at bald eagle nests in Arizona and Michigan found that helicopters elicited the greatest frequency of response,

compared to military jets and light planes (Grubb and Bowerman 1997). There are reports of juvenile bald eagles being blown out of nests by the rotor wash of helicopters (Jorgenson, pers. comm. 2002), but no similar reports of disturbance by fixed-wing aircraft. Helicopter flights addressed in this assessment are not expected to approach bald eagle nest sites, except flights to the Porcupine Lookout. In that case, the flight route would be over areas near the center of Waterton Lake, away from the nest site, before proceeding up the Waterton Valley. Spring or autumn flights to other lookouts may also potentially affect migrant eagles.

Helicopter flights have the potential to disturb and displace grizzly bears in any habitat. Research in Canada and Glacier National Park documented that grizzly bears ran away from helicopters when approached (Harding and Nagy 1980, Kendall 1986). Bears that move away from a disturbance risk expending extra energy and possibly entering an area occupied by another bear. Bears that stay in the area may experience stress (McLellan and Shackleton 1989).

Low level flights have the potential to displace and/or disrupt normal behavior patterns of grizzly bears present along flight paths. Several studies have documented the behavioral responses of grizzly bears to various types of aircraft disturbance. A summary of the literature by the Interagency Grizzly Bear Committee (IGBC 1987) concluded that there is wide variability in the reaction of grizzly bears to aircraft disturbances. Factors which may affect the way bears respond to aircraft include the degree of habituation to the activity, availability of escape cover, and the type, noise level, altitude, and movements of the aircraft involved. Impacts of aircraft on bears can include possible displacement, or physiological arousal without overt response. Bears may be less likely to flee from aircraft while they are feeding.

Some studies have indicated that grizzlies may be more sensitive to helicopters than to fixed-wing aircraft (Harding and Nagy 1980). Kendall (1986) documented that 81% of grizzlies observed during low-level helicopter flights in the Apgar Mountains of GNP displayed a strong reaction. A “strong” reaction was defined as a bear moving faster than a slow walk, while a “mild” reaction was indicated when a bear did not move at all or slowly walked as the helicopter approached. Because of the apparent tendency of grizzly bears in GNP to be more active during daylight hours in the fall than in spring or summer, fall flights could have a greater impact on bears.

Klein (1974) found that aircraft overflights at altitudes above 500 feet did not elicit a panic response. He suggested that under extreme weather or stress conditions, the net result of several overflights could be deterioration in the condition of the animals. Flights would be spread out over the park and would occur at various times, leaving plenty of space for relocation of disturbed animals. However, areas for displacement are not always available to a bear, due to occupation by another bear. In frequently disturbed locations, animals may become habituated to aircraft activities. Fixed-wing flights can occur over any area of the park, but the effects of fixed-wing aircraft are less severe than helicopters.

Grizzly bears are known to frequent the avalanche chutes and shrubfields on the Glacier Wall and Mt. Cannon, in the McDonald Valley, during the spring and early summer. Helicopter disturbance can be minimized by following a flight path high above the road corridor, at an elevation of 2000 feet AGL, for flights to Granite Park and Swiftcurrent

Lookout during that period. Other known grizzly bear seasonal concentration areas, such as army cutworm moth sites on several mountain peaks from July through September, and the Apgar Range during August and September, would also be avoided as much as possible.

In the event that a loaded helicopter crashed or dropped the human waste, grizzly bears could be attracted to the site of the spill.

Monitoring of wolves in Montana from fixed-wing aircraft appears to have little impact, with wolves often showing little or no response to even low-flying aircraft, though wolves usually run from approaching helicopters (Meier, pers. comm. 2003). Effects of helicopter or fixed-wing aircraft flights on Canada lynx are less well known; we were unable to find any published literature on the subject. Wolverine response to fixed-wing aircraft is variable; in general, the response of most animals is minimal, while some run (Copeland, personal communication 2003). Helicopters generally elicit a stronger reaction. Wolverine in dens are probably little affected by overflights.

Monitoring information collected during wildlife flights is vital for conservation of these species. Wildlife flights would indirectly benefit listed species by contributing to the long-term population productivity data base for bald eagles and gray wolves, grizzly bear conservation through anticipating and minimizing human-bear conflicts, and basic life history information for Canada lynx and wolverine. All listed species would benefit by a greater understanding of their distribution, movements, reproduction, survivorship, and other important aspects of their natural history. Effective conservation and management of listed species and other wildlife is dependent on reliable information, such as that gained by research and monitoring supported by wildlife survey flights.

Cumulative Impact Analysis: With Alternative A, the proposed additional flights would add to the effects of already approved flights, administrative flights by other agencies or commercial flights occurring over Glacier National Park in 2003, as well as the effects of other projects with potential to displace wildlife. Cumulative effects would be minor to moderate, localized, short-term and adverse.

Conclusion: Alternative A would have minor to moderate, short-term, site-specific to local, adverse effects to bald eagles, grizzly bears, Canada lynx, gray wolves, and bighorn sheep, if individual animals flee from the aircraft, or are displaced from favorable foraging sites. There would be long-term, minor to moderate, regional beneficial impacts to listed species from fixed-wing flights as monitoring information is used to help conserve these species. Cumulative effects would be minor to moderate, localized, short-term and adverse due to additional flights and disturbance from other park projects temporarily displacing listed species.

Alternative A would not produce major adverse impacts on threatened and endangered species or species of concern whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment on threatened and endangered species or species of concern as a result of the implementation of Alternative A.

Alternative B: (No Action)

Impact Analysis: There would be little or no adverse impact to bald eagles, gray wolves, Canada lynx, or wolverine if waste were not removed from Granite Park Chalet. If toilets failed and human waste was dispersed over a wide area around Granite Park Chalet, the waste would not likely attract and displace bald eagles, bighorn sheep, Canada lynx, golden eagles, gray wolves, or wolverine, and would not likely affect bull trout as they do not inhabit nearby waters. Past experience suggests that grizzly bears in the area of Granite Park Chalet may be attracted to spilled sewage, potentially resulting in increased bear-human conflicts; other management efforts would likely be employed to minimize those conflicts. This could result in minor, localized, long term adverse impacts on grizzly bears. Failure to complete the repair of the radio repeaters, or rehabilitate Porcupine Lookout would have little or no effect on threatened or endangered species or species of concern.

Failure to conduct fixed-wing monitoring flights would have no direct impact on threatened or endangered species or species of concern. However, the park is required to comply with the Endangered Species Act, so monitoring information must be gathered for listed species in order to determine the impacts of park projects on these species.

Failure to monitor backcountry bald eagle nests during the early part of the nesting season (March-April) would result in incomplete information on nest occupancy and population trend. Early season surveys determine whether nesting territories are occupied (adult pair present) or active (adult on nest), and are used to determine nesting success, calculated as the number of young per occupied or active nest (Montana Bald Eagle Working Group 1994). Nests that are occupied or active may fail before ground surveys can determine status. Thus, lack of this information would allow for no standard measure of nest success, nor allow comparison with data collected from nests in Glacier National Park during the past 20 years, or from nests elsewhere in Montana or North America. The park would fail to meet the guidelines of the Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994) and would lose continuity in the most complete set of population trend data for any species of wildlife in the park. Loss of information on early season nest failures would limit the ability to manage the parkwide bald eagle population toward recovery.

Failure to monitor bull trout from fixed-wing aircraft would result in reduced monitoring, as ground monitoring would require extensive travel in remote areas of the park.

Failure to monitor gray wolves and management grizzly bears from aircraft would result in less information on the movements, pack size, and pup production of wolves and on the movements of grizzly bears. Less accurate, less reliable, and less complete information can be obtained from ground tracking, and obtaining comparable information from the ground would very likely require close approaches and more disturbance of wolves and bears. Since the proposed flights would supplement non-NPS wolf and management grizzly bear monitoring flights, failure to conduct them may result in fewer overall monitoring flights, and the park would not be a contributor to aerial monitoring of wolves and grizzlies within park boundaries.

Failure to conduct flights for bighorn sheep research would result in the loss of the radio collar and the location data for that animal, since all the data is stored on the collar.

Failure to monitor radio-collared lynx from fixed-wing aircraft during October may result in the inability to capture radio-collared lynx for the purpose of replacing or removing GPS collars as part of the lynx research project. However, depending on the location of animals, ground-based telemetry may be adequate and flights may be unnecessary. Failure to monitor radio-collared wolverine would result in fewer locations of radio-instrumented animals that range very widely; thus, some long-range movements may not be detected, affecting conclusions about home range size and movement patterns. Lack of frequent locations during the spring, when ground locations are difficult or impossible and probably more disruptive, may result in lack of any information on wolverine den sites, one of the major objectives of the wolverine study.

Failure to gather data would result in minor to moderate, long-term, regional adverse effects to threatened and endangered species and species of concern.

Cumulative Impact Analysis: Alternative B would mean the park would not contribute aerial monitoring data to that collected by outside agencies. There would be a minor to moderate indirect long-term regional adverse cumulative impact to threatened and endangered species and species of concern. Closing the toilets at Granite Park could result in minor, localized, long-term adverse impact on grizzly bears. Failure to complete repair of the radio repeaters, or rehabilitate Porcupine Lookout would have little or no effect on threatened or endangered species or species of concern. Therefore this action would not add to the negligible effects from the already approved 22 flights.

Conclusion: Alternative B would have minor to moderate, long-term, regional adverse and beneficial effects on threatened or endangered species or species of concern. Cumulative effects would be minor to moderate and adverse due to the park's inability to compare data with that of other agencies. Under Section 7 of the Endangered Species Act, Alternative A would result in a "may effect, not likely to adversely affect" determination for grizzly bears, bald eagles, Canada lynx and gray wolves. There would be "no effect" on bull trout.

Alternative B would not produce major adverse impacts on threatened and endangered species or species of concern whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of on threatened and endangered species or species of concern as a result of the implementation of Alternative B.

Wildlife

Alternative A: Conduct administrative helicopter and fixed-wing flights in 2003 (Preferred alternative)

Impact Analysis: Fixed-wing flights are not considered to have detrimental effects on wildlife if they stay above 500 feet altitude (Klein 1974). When aircraft must drop below 500 feet to get a closer look at a wolf den, for example, some wildlife species could be disturbed for a short time. Ungulates are likely to flee if approached by low level aircraft. Flight paths would avoid cliffs known to contain mountain goats to avoid disturbance.

Helicopter flights to Granite Park Chalet would be frequent, so displacement of wildlife in the vicinity of the landing site would occur for a slightly longer time. Helicopter flights to radio towers could displace some wildlife from open alpine areas for a short time. Helicopter flights to Porcupine Lookout would displace wildlife for a short time. Given the susceptibility of mountain goats to helicopter disturbance (Cote 1996), and the wide distribution of goats in the park, especially in the area of the Granite Park Chalet and the Swiftcurrent and Porcupine Lookouts, displacement and potential injury may be unavoidable. Effects of administrative flights on wildlife would be minor to moderate, short-term, localized adverse effects.

Cumulative Impact Analysis: With Alternative A, the proposed flights would add to the effects of other agency administrative flights or commercial flights occurring over Glacier National Park in 2003, as well as other ongoing projects. The cumulative effect would be minor to moderate, short-term, localized adverse effects due to temporary displacement of listed species.

Conclusion: There would be minor to moderate, short-term, site-specific to localized adverse effects to wildlife with Alternative A due to displacement from 74-80 helicopter flights, and 30-40 fixed-wing flights. Cumulative effects would be minor to moderate, short-term localized and adverse due to temporary displacement of listed species.

Alternative A would not produce major adverse impacts on wildlife whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of wildlife as a result of the implementation of Alternative A.

Alternative B: (No Action)

Impact Analysis: Alternative B, No Action, would not directly impact wildlife if waste were not removed from the chalet, and Porcupine Lookout were not rehabilitated, nor if radio communications were impaired. However, if the toilet system at Granite Park failed, waste would then have to be dispersed over a wide area surrounding the Chalet, which would result in attraction of wildlife. This would increase the risk of wildlife-human interactions. Alternative B, no action, would mean that monitoring flights would be replaced with monitoring of wildlife on the ground. This would lead to disturbance of wildlife due to off trail travel and camping in undesignated campgrounds. There would be minor, short-term, site-specific, indirect adverse impacts to wildlife with Alternative B.

Cumulative Impact Analysis: There would be no cumulative effects with Alternative B, no action.

Conclusion: Alternative B would have minor, short-term, site-specific, adverse effects on wildlife due to increased ground disturbance and increased risk of wildlife-human interactions. No cumulative effects to wildlife are anticipated from Alternative B.

Alternative B would not produce major adverse impacts on wildlife whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of wildlife as a result of the implementation of Alternative B.

Vegetation

Alternative A: Conduct administrative helicopter and fixed-wing flights in 2003 (Preferred alternative)

Impact Analysis: Helicopter landings, if they occur when no snow is on the ground, would trample and disturb vegetation at Apgar Lookout and West Glacier. No other landing areas are vegetated. Adverse effects would be negligible and short-term.

Cumulative Impact Analysis: Helicopter landings would not add to the effects of any of the other flights in the park, as they do not involve landings, nor would they add to the effects of other projects in the park, as these would occur at different locations.

Conclusion: Alternative A would have negligible, short-term adverse effects on vegetation. There would be no cumulative effects on vegetation.

Alternative B: (No Action)

Impact Analysis: Failure of the toilets at Granite Park Chalet and Patrol Cabin would mean visitors and employees would trample vegetation and would dispose of human waste over a wide area. Impacts to vegetation would be minor, long-term and adverse. Failure to repair radio towers, and rehabilitate Porcupine Lookout would have no impact on vegetation. Lack of aerial monitoring for wildlife would mean more ground monitoring; this would have a negligible to minor, short-term adverse effect to vegetation from trampling.

Cumulative Impact Analysis: There would be no cumulative impacts on vegetation with Alternative B, No Action.

Conclusion: Alternative B, No Action, would have negligible to minor, short-term adverse effects on vegetation due to trampling at Granite Park and wildlife monitoring areas.

Park Operations

Alternative A: Conduct administrative helicopter and fixed-wing flights in 2003 (Preferred alternative)

Impact Analysis: Removing the waste from Granite Park Chalet and Patrol Cabin via helicopter would provide the least amount of exposure to the environment due to a spill. Early season flights would not affect park operations in the area since no visitors would be displaced. Mid-season flights would have negligible, site-specific short-term adverse effects on park operations in the area due to the need to keep visitors out of the helicopter landing area. There would be minor to moderate, localized, long-term beneficial impacts of Alternative A to park operations.

Flights to radio towers would enable employees to efficiently repair and maintain radio communications equipment, thus providing for communications among employees and safety for visitors. Flights to Porcupine Lookout would allow timely installation of radio equipment in a weatherproof building. There would be moderate, parkwide, long-term beneficial effects from Alternative A.

Monitoring flights would provide accurate, reliable data on wildlife populations for park managers to use in making decisions on park projects that would benefit or protect wildlife species. There would be minor, parkwide, long-term beneficial impacts to park operations from Alternative A.

Cumulative Impact Analysis: Alternative A would not add to the effects of other agency administrative flights, commercial flights, or other park projects on park operations. No cumulative effects are anticipated with Alternative A.

Conclusion: There would be negligible, site specific, short-term, adverse impacts to park operations under Alternative A due to visitor displacement. There would be minor to moderate, long-term beneficial impacts locally and parkwide. No cumulative impacts to park operations are anticipated from Alternative A.

Alternative A would not produce major adverse impacts on park operations whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park operations as a result of the implementation of Alternative A.

Alternative B: (No Action)

Impact Analysis: Failure to remove the waste would result in contamination of the area and human health problems. The Granite Park patrol cabin houses trail workers and rangers throughout the summer months, and is located directly above the Granite Park backcountry campground. Both facilities use the same water source and if the composting toilet failed, water systems for both facilities would become contaminated. This would result in contamination of the surrounding area, and hundreds of visitors would be displaced. Adverse effects would be minor to moderate, localized and long-term.

Failure to repair radio towers and equipment would reduce communications among park employees and would jeopardize life safety for park staff and visitors. More time and money would be spent hiking or packing equipment in to those sites that could be repaired. Those sites that need larger equipment would be left in disrepair. Failure to rehabilitate Porcupine Lookout and install radio equipment would limit communication abilities and homeland security. Adverse effects would be minor to moderate, parkwide and long-term.

Failure to collect wildlife monitoring data from aircraft would mean less data would be collected, and it would be done from the ground. This would require more employee time and expense, and less accurate, less reliable data would be used to make decisions on park projects that could impact wildlife. Adverse effects would be minor, parkwide and long-term.

Cumulative Impact Analysis: There would be no cumulative effects on park operations with Alternative B, No Action.

Conclusion: Alternative B would have minor to moderate, long-term adverse effects, both locally and parkwide, on park operations. No cumulative impacts to park operations are anticipated with Alternative B.

Alternative B would not produce major adverse impacts on park operations whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of park operations as a result of the implementation of any of Alternative B.

Visitor Experience

Alternative A: Conduct administrative helicopter and fixed-wing flights in 2003 (Preferred alternative)

Impact Analysis: Visitors look to these backcountry and wilderness areas for outstanding opportunities for solitude, natural quiet, and primitive or unconfined types of recreation. Visitors would be displaced for extended periods of time during flight operations. Helicopter use in the backcountry and wilderness areas during the off season would minimize the number of visitors impacted. Flights to Granite Park are planned before and after the visitor season.

Flights would allow the Granite Park Chalet toilet to continue to function, enabling the chalets to continue to provide a service to visitors. Flights would allow for continuity of radio communications, providing for visitor safety. Rehabilitation of Porcupine Lookout would also enhance radio communications. Wildlife monitoring flights would provide data on wildlife in the park, which is used to provide interpretive programs to visitors. Alternative A would produce minor, short-term, site-specific adverse impacts, and minor to moderate, long-term beneficial impacts on visitor experiences.

Cumulative Impact Analysis: With Alternative A, the proposed flights would add to the effects of flights to Logan Pass, emergency flights for search and rescue and fire operations, outside agency administrative flights, and commercial flights occurring over Glacier National Park in 2003, by extending the area and the length of time visitors are impacted by noise from aircraft. Visitors in the Apgar, Many Glacier Hotel, and Belton Bridge areas would also be additionally impacted if flights were occurring at the same time as those construction projects, but this is unlikely to be more than a minor effect. Cumulative effects would be minor to moderate, short-term, localized and adverse.

Conclusion: Alternative A would have minor, short-term site-specific adverse impacts on visitor experience due to visitor displacement during helicopter landings and long-line transport of materials, noise, and use of mechanical equipment in remote wilderness and backcountry settings. There would be minor to moderate long-term beneficial impacts due to continued function of the chalet toilet, continued radio communications, and collection of wildlife data for interpretive programs. Cumulative effects would be minor to moderate, short-term, localized adverse impacts due to additional flights and construction projects occurring simultaneously.

Alternative A would not produce major adverse impacts on visitor experience whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of visitor experience as a result of the implementation of Alternative A.

Alternative B: (No Action)

Impact Analysis: Fewer flights would have minor short-term beneficial impacts to visitor experience. Alternative B would not produce noise, but if the chalet toilet failed, there would be major long-term adverse impacts to visitor experience. If human waste at Granite Park Chalet were dispersed over a wide area, this would attract wildlife including grizzly bears, increasing the risk to visitor safety. If radio communications were limited, visitor safety would be compromised. If no wildlife flights occurred, less information would be collected about wildlife in the park, and visitors would lack information and interpretive programs about wildlife. Alternative B would have minor short-term and major long-term adverse impacts, and minor short-term beneficial impacts, on visitor experience.

Cumulative Impact Analysis: There would be no cumulative impacts with Alternative B.

Conclusion: Alternative B would produce minor short-term and major long-term adverse impacts on visitor experiences due to increased risk of wildlife-human interactions, decreased radio communications, and decreased information on wildlife. No cumulative effects to visitor experience are anticipated with Alternative B.

Alternative B would produce major adverse impacts on visitor experience whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be impairment of visitor experience as a result of the implementation of Alternative B.

CONSULTATION AND COORDINATION

Agencies Contacted:

Blackfeet Tribal Business Council
Montana Department of Environmental Quality
Montana Department of Fish, Wildlife & Parks
Montana Department of Natural Resources & Conservation
National Park Service Intermountain Regional Office, Environmental Quality
National Park Service Washington Office, Water Resources Division
State Historic Preservation Office
U.S. Fish & Wildlife Service

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List of Environmental Assessment Recipients:

Coalition for Canyon Preservation
Confederated Salish and Kootenai Tribal Preservation Office
Conrad Burns, United States Senate
Council of Historic Preservation
Dennis Rehberg, United States House of Representatives Missoula Offices
Ev and Margaret Lundgren
Flathead County Board of Commissioners
Flathead National Forest
Flathead Regional Development Office
Fred Matt, Chair, Confederated Salish and Kootenai Tribal Council
Friends of the Wild Swan
Glacier County Commissioners
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John Case
Joyce Spoonhunter, Blackfeet Tribe Culture Department
Judy Martz, Governor of Montana

Karen Wade, Regional Director, National Park Service, Denver
Max Baucus, United States Senate
Mayor of Browning, Montana
Mayors and City Councils of Kalispell, Columbia Falls and Whitefish
Montana Department of Environmental Quality Permitting & Compliance, Helena
Montana Environmental Information Center
Montana Fish, Wildlife, & Parks Supervisor Region One, Kalispell
Montana Intergovernmental Clearing Office of Budget & Planning
Montana Wilderness Association
Mr. and Mrs. Galvin
National Parks and Conservation Association
Norman and Jean Adams
Pat and Riley McClelland
Public Libraries: Kalispell, Whitefish, Columbia Falls, Helena, Butte, Browning, Bozeman, Great Falls, Missoula, Bigfork, and Lethbridge, Alberta, Canada
Richard Kuhl
State Historic Preservation Office
U.S. Fish and Wildlife Service
Waterton Lakes National Park
Wilderness Watch

COMPLIANCE WITH FEDERAL AND STATE REGULATIONS

The NPS would comply with all applicable federal and state regulations when implementing the preferred alternative.

National Environmental Policy Act (NEPA) and Regulations of the Council on Environmental Quality
The National Environmental Policy Act applies to major federal actions that may significantly affect the quality of the human environment. This generally includes major construction activities that involve the use of federal lands or facilities, federal funding, or federal authorizations. If the environmental effects are undetermined then an Environmental Assessment (EA) is prepared to evaluate potential impacts. This EA meets the requirements of the NEPA and regulations on the Council on Environmental Quality in evaluating potential effects associated with activities on federal lands. If no significant effects were identified in this evaluation, a finding of no significant impact (FONSI) would be prepared. If significant impacts were identified, then a notice of intent (NOI) would be filed for preparation of an Environmental Impact Statement.

The Endangered Species Act of 1973, as Amended (16 U.S.C. 1531 et seq.)
Section 7 of the Endangered Species Act is designed to ensure that any action authorized, funded, or carried out by a federal agency likely would not jeopardize the continued existence of any endangered or threatened plant or animal species. If a federal action may affect threatened or endangered species, then consultation with the U.S. Fish and Wildlife Service (USFWS) is required. The NPS has entered into section 7 consultation with the USFWS and has determined the proposed flights "may affect, not likely to adversely affect" threatened bald eagles, Canada lynx, gray wolves, and grizzly bears. The NPS determined "no effect" to threatened bull trout. A biological assessment has been prepared and submitted to the USFWS for concurrence.

National Historic Preservation Act of 1996, as Amended (16 U.S.C. 470, et. Seq.)
Section 106 of the National Historic Preservation Act of 1966 (as amended) requires all federal agencies to consider effects from any federal action on cultural resources eligible for or listed on the National Register of Historic Places (NHRP), prior to initiating such actions. The preferred alternative would have no effects on cultural resources and no further compliance would be done.

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Figure 1. Glacier National Park 2003 helicopter flight destinations.