

Draft Commercial Services Plan and Draft Environmental Impact Statement

**GLACIER NATIONAL PARK
Montana**

Waterton Glacier International Peace Park

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

Draft Commercial Services Plan and Draft Environmental Impact Statement

Glacier National Park

A Portion of Waterton-Glacier International Peace Park
Flathead and Glacier Counties, Montana
May 2003

ABSTRACT

The purpose of this *Draft Commercial Services Plan and Draft Environmental Impact Statement* is to create a vision for commercial services in Glacier National Park based on the 1999 *General Management Plan and Environmental Impact Statement*. It evaluates the level and types of commercial visitor services that are necessary and appropriate for the foreseeable future. It also evaluates new services and determines how to retain well-known traditional services within an aging infrastructure that requires major capital expenditures to preserve and maintain.

This document presents alternatives for commercial services, and site and facility improvements in the developed areas of the park (Apgar, Two Medicine, Lake McDonald, Rising Sun, Many Glacier and Swiftcurrent). Alternative A, the status quo alternative, addresses those improvements needed to correct life safety and health issues in the absence of a long-range plan.

This *Draft Commercial Services Plan and Draft Environmental Impact Statement* has been prepared in accordance with the National Environmental Policy Act and analyzes the potential environmental consequences of the alternatives.

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Chapter 1 Purpose and Need for the Plan





Chapter 1

Purpose and Need for the Plan

Glacier National Park, a portion of Waterton-Glacier International Peace Park, is a special place that is recognized for its dramatic scenery, wildlife, wildlands, history and cultural resources. The outstanding universal value of this park is evidenced by its purpose and significance that were defined

Glacier National Park Management Philosophy

Glacier National Park seeks to manage most of the park for its wild character and for the integrity of Glacier's unique natural heritage, while traditional visitor services and facilities remain. Visitors would be able to enjoy the park from many vantage points. Visitor use would be managed to preserve resources, but a broad range of opportunities would be provided for people to experience, understand, study and enjoy the park. Cooperation with park neighbors would be emphasized in managing use and resources.

in the 1999 General Management Plan based on legislation, legislative history and historic trends. The General Management Plan also captured a vision for the park's future that is based on tradition, as well as the preservation of the natural and cultural resources that make the park so treasured today.

The purpose of the 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).
- Celebrate the ongoing peace, friendship and goodwill among nations, recognizing the need for cooperation in a world of shared resources (1932 International Peace Park legislation) (NPS 1999c).

The significance of Glacier National Park is the essence of the park's importance to our natural and cultural heritage:

- Glacier's scenery dramatically illustrates an exceptionally long geologic history, and the many geological processes associated with mountain building and glaciation.
- Glacier offers relatively accessible spectacular scenery and increasingly rare primitive wilderness experiences.
- 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 reflect the history of human activities (prehistoric people, American Indians, early explorers, railroad development, and modern use and visitation) that show[s] how people have long placed high value on the area's natural features.
- Waterton-Glacier is the world's first international peace park.

The park defines **commercial services** or activities as endeavors that use park resources, including roads and trails, and that result in compensation, monetary gain, benefit or profit to an individual, organization or corporation whether or not such entity is organized for purposes recognized as non-profit under local, state or federal law. "Gain" is defined as compensation beyond actual cost.

To provide for the public's experience, enjoyment and appreciation of the park, facilities have been developed to accommodate visitors. There is a long tradition of providing these opportunities for visitors through commercial services contracts with private businesses. Years before Glacier became a national park, local residents offered visitors overnight lodging and food services at the lodge on Lake McDonald. Shortly after the establishment of the park, the Great Northern Railway sought to attract wealthy tourists to the area from the East. These visitors were promised a western experience created by the majestic landscape and accompanied by grand lodging and dining facilities, as well as recreational opportunities. Within two to three decades, the park saw a shift in the national economy and an increase in automobile travel, which brought a new kind of visitor who drove to the park and sought affordable accommodations. The Park Service responded with the development of auto camps and motor inns.

Commercial services today continue to enhance the visitor experience of the park while reflecting the park's purpose and significance. The park still offers many of the historic accommodations and other services that were an important part of the early park experience, and has expanded visitor opportunities to include a variety of resource-oriented recreational activities such as guided photography and art seminars and bicycle tours.

Current commercial services include overnight lodging, food and beverage services, gift shops and campstores, interpretive vehicle tours and transportation, guided horseback rides and packing services, guided backpacking and day hiking, interpretive boat tours and small boat rentals, guided bicycle tours, guided photography and art seminars and guided cross-country skiing. The private businesses that provide these services operate under one of two types of authorizations with the National Park Service: *concessions contracts* or *commercial use authorizations* (CUAs — formerly incidental business permits).

Concessions contracts are issued through a competitive evaluation process. These contracts require a concessioner to provide specific services. The numbers of contracts are limited and may or may not assign facilities inside the park for the concessioner's use. Since concessioners are required to provide the services, it is incumbent on the National Park Service to ensure that there is a reasonable opportunity for the operator to earn a profit.

Commercial use authorizations can be issued to authorize services, but do not require that the services be provided. The number of CUAs is typically not limited because they are not issued through a competitive evaluation process. A CUA will be issued to any qualified operator who is willing to agree to its terms and conditions. Unlike a contract, there is no assurance of an opportunity to earn a profit. Typically, no facilities are provided for the concessioner's use inside the park.

“Necessary and appropriate”

determination is based on the Organic Act, park purpose and significance and the General Management Plan. The criteria below were developed by Glacier National Park.

A service that is “necessary” accomplishes one or more of the following:

1. Contributes to visitor understanding and appreciation of park purpose and significance.
2. Enhances visitor experiences consistent with park area philosophies.
3. Assists the park in managing visitor use and educating park visitors.
4. Is an essential service or facility not available within a reasonable distance from the park.

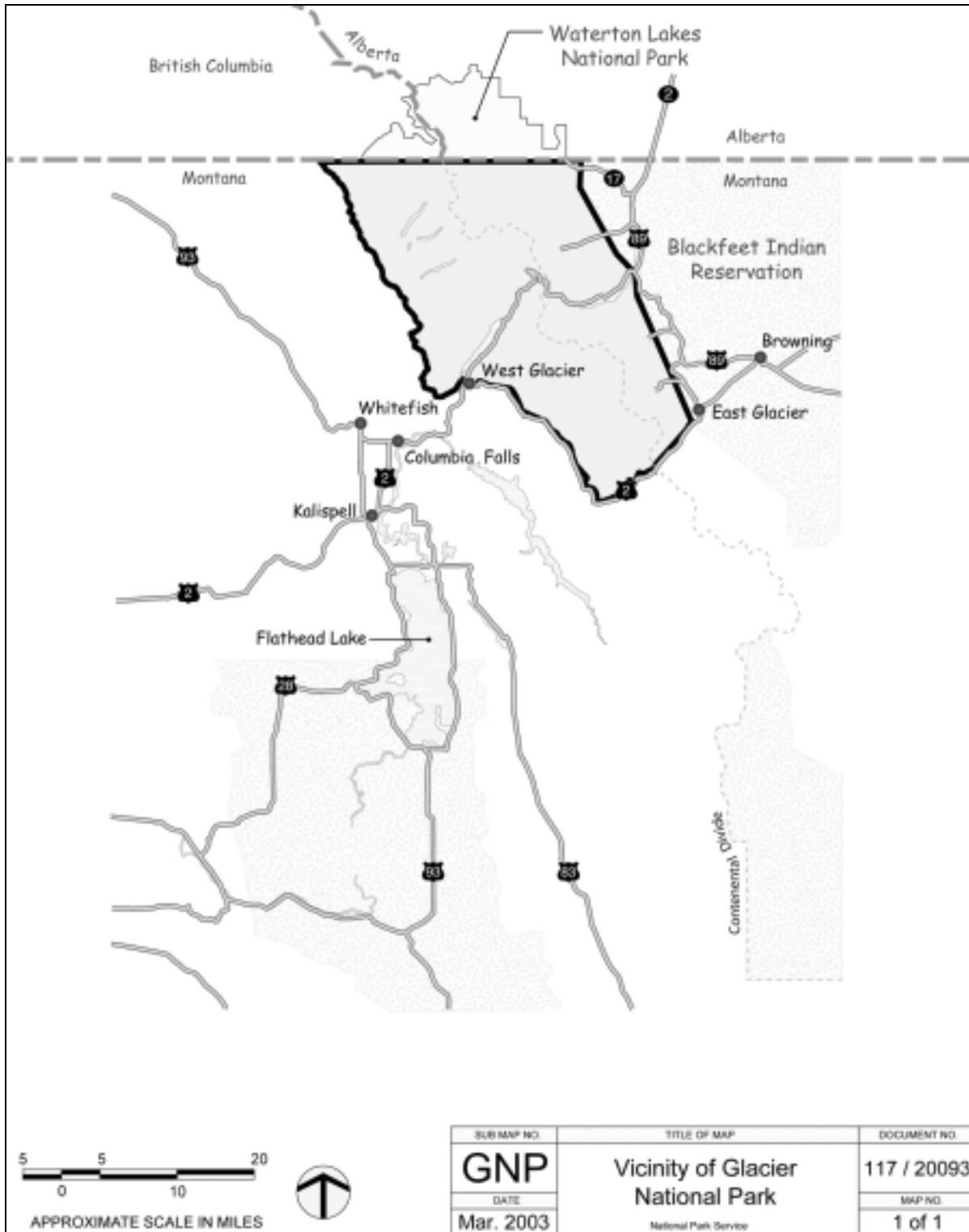
A service that is “appropriate” accomplishes all of the following:

1. Is consistent with the purpose and significance of Glacier National Park.
2. Is consistent with laws, regulations and policies applicable to Waterton-Glacier International Peace Park and the National Park Service.
3. Does not compromise public health and safety.
4. Does not significantly impact or impair park resources or values.
5. Does not unduly conflict with other park uses and activities.
6. Does not exclude the general public from participating in limited recreational opportunities.

Park management determines the appropriate type of authorization for each service. Changing conditions influence which type is most appropriate; therefore, these decisions will not be made in this plan. Commercial services play a vital role in meeting the mission of the Park Service, providing appropriate, quality services to the public that the Park Service could not realistically furnish. However, federal law requires that the Park Service allow only commercial services and development that are considered necessary and appropriate. Sustaining these services and planning for the future are important considerations for the National Park Service in developing this plan.

There has never been a comprehensive analysis of the range and type of commercial services that are offered in Glacier National Park. The General Management Plan identified some issues that require more consideration and analysis. Historic facilities are deteriorating and require rehabilitation. Contracts for existing concessioner services are expiring and decisions about these services need to be made before new contracts can be issued. There are also requests for new services that need to be evaluated. Long-range planning is needed to ensure that commercial services continue to play a complementary role, provide quality, necessary and appropriate services to the visiting public, and keep Glacier National Park “the way it is.”

It is the purpose of this *Draft Commercial Services Plan and Draft Environmental Impact Statement* to describe the vision for commercial services in Glacier National Park and to determine the level and types of commercial visitor services that would be **necessary and appropriate** for the foreseeable future. The purpose is also to determine how to retain the well-known traditional services such as grand historic hotel lodging, family accommodations, historic boat tours and horseback trips in the backcountry, since the infrastructure that supports most of these services has deteriorated and requires major capital expenditures to preserve and maintain. Improvements would also be necessary to add new, approved services. For each developed area, the plan also considers infrastructure and site improvement alternatives related to commercial services.



MAP 1-1 VICINITY OF GLACIER NATIONAL PARK

The goals of this *Draft CSP and Draft EIS* are to:

- Determine the appropriate overall mix of necessary and appropriate commercial services.
- Establish the framework for future decisions.
- Establish the character and level of service by park area based on need, expectation, economic feasibility and resource implications.
- Provide a clear vision and phased implementation strategy for rehabilitating the historic hotels.
- Continue a wide range of related visitor experiences.
- Provide the specific information necessary for the issuance of concession contracts.

Upon approval of the *Draft CSP and Draft EIS* and issuing the Record of Decision, it is the intent of the National Park Service to implement the plan by:

- Beginning the process of issuing concession contracts and other commercial authorizations for new and existing services.
- Developing construction documents for rehabilitation in consultation with the State Historic Preservation Office where appropriate.
- Beginning construction and rehabilitation as funding is obtained.
- Developing schematic designs for the selected alternatives in the developed areas.

PUBLIC INVOLVEMENT AND ISSUES TO BE ADDRESSED BY THE PLAN

The public involvement process began with the publication of a notice in the *Federal Register* on September 12, 2000, announcing that a *Commercial Services Plan/Environmental Impact Statement* would be prepared for Glacier National Park. Opportunities for early public participation were provided through a series of public open houses, a newsletter released in November 2000 and a comment form available on the National Park Service's Commercial Services Plan Web site. Open houses were held in Kalispell, Great Falls, Missoula and Browning, Montana, and in Lethbridge, Alberta, Canada, between December 4 and December 7, 2000. Scoping comments from the public were requested by December 30, 2000.

Early meetings were held with state and local agencies and tribal governments. All comments received from the public during the General Management Plan process regarding commercial services were reviewed again.

Below is a discussion of concerns and issues that were identified during scoping and during the General Management Plan process by the public, other agencies and the park staff. These issues and concerns provided the framework for the development of alternatives and the selection of impact topics for environmental analysis.

- **Employee Housing**

The types of available concession employee housing affect the concessioner's ability to hire adequate numbers of staff to effectively operate visitor facilities. The amount and quality of current concession employee housing needs to be improved and health and life safety issues must be addressed at all locations throughout the park. Addressing these issues may result in a loss of rooms. Most employee housing offers only basic, dormitory-style amenities that are suitable for young, single employees.

Opportunities for early public participation were provided

Few, if any of the housing units have private bathrooms. None of the employee housing provides kitchen facilities, except for the caretaker housing units. This type of housing makes it difficult for concessioners to hire older, more experienced employees, married couples or employees with families. Although housing concession employees outside of the park is an option, it generates other issues, such as the lack of available land or housing for rent, as well as transportation and food service for employees who work different shifts.

- **Visitor/Employee Separation**

Visitor accommodations are not separated from concession employee housing/recreation areas at Lake McDonald, Rising Sun, Many Glacier and Swiftcurrent. Employees often socialize late into the night or come and go at odd hours due to work schedules, potentially disturbing guests in nearby accommodations. Many employee dining areas are in the main public areas. During their free time, employees often use these prime visitor areas for recreation. In addition, employees and visitors compete for parking. This lack of separation creates a less than ideal experience for visitors and employees.

- **Vehicle and Pedestrian Access**

All of the developed areas were built when the park had fewer visitors and cars. Parking is limited and congestion occurs in these areas during the peak season. For example, Apgar and Lake McDonald are not well-designed for pedestrians. Pedestrian access to the lakeshore at Apgar is not well-defined and private property boundaries are not clearly marked. In some areas, public access to facilities is gained by passing by or through utility and maintenance areas. Lake McDonald Lodge, which historically received arriving visitors by boat, was originally oriented toward the lakeshore, with support buildings located at what has become the front access to the hotel. This change in arrival has resulted in a mix of development and roads that are confusing to first-time visitors.

- **Health, Life Safety and Accessibility**

Many of the historic structures in the park that are operated by concessioners (hotels, motels, restaurants and employee housing) have health and life safety issues that place these structures, visitors and employees at risk. Most renovations occurred over 40 years ago. Issues include the presence of asbestos and pests, wiring and plumbing that do not meet code, and outdated fire warning and sprinkler systems. Additionally, most of these structures do not meet current Americans With Disabilities Act (ADA) standards. There have been a few recent renovations on portions of the Many Glacier Hotel and Lake McDonald Lodge.

The General Management Plan recommends maintaining a minimum of 500 guest rooms parkwide, not including the backcountry chalets and lodging on private lands. However, addressing health, life safety and ADA compliance issues may result in a loss of overnight rooms. Finding locations for lost rooms may require new construction in the developed areas.

- **Floodplains**

Floodplains are among the many natural resources in the park where the National Park Service usually avoids development; however, floodplains were not a concern in the early part of the century when most of the developed areas were selected. Therefore, most of these areas lie within 100-year floodplains, placing employees, visitors and historic structures at risk.

- **Sensitive Natural Resources**

Many of the developed areas contain a number of sensitive natural resources, including federally listed wildlife (the bull trout, Canada lynx, gray wolf, grizzly bear and bald eagle), wetlands and state listed rare plants. These areas, which are within the visitor services zone, are important habitat for some of the threatened and endangered species. They are also important winter and spring range for elk, deer and bighorn sheep, who provide food for some threatened and endangered species.

Although many of the developed areas have existed for 90 years or more, increased development and visitation to the surrounding areas may affect these species' behavior, cause displacement, affect their prey base, and ultimately affect their ability to survive. There are commercial services located in or near sensitive resource locations; the Village Inn on the shore of Lake McDonald, the horse corral near Lake McDonald Lodge and Granite Park Chalet are examples.



USFWS Photo

- **Future Use of Granite Park Chalet**

Two chalets that are national historic landmarks grace the backcountry of Glacier. Both chalets were closed to the public in 1992 due to substandard water and sewage systems, inadequate life safety, and deteriorating facilities. A decision was reached through an Environmental Assessment in 1993 that both chalets be rehabilitated and returned to providing full service (lodging and meals). Funding was obtained to complete the full rehabilitation of Sperry Chalet, which reopened to the public in 1999. Only partial funding was obtained to complete some of the structural stabilization work on Granite Park Chalet. Granite Park was reopened to the public in 1996 with services limited to a hiker shelter with public cooking facilities.

During the rehabilitation of Sperry Chalet, it became evident that the time, funding and impacts to resources related to materials, disturbance and helicopter supply flights were underestimated and not fully analyzed in the Environmental Assessment. During scoping for this plan and during the General Management Plan process, the public expressed interest in having the future of the chalet revisited. Many participants expressed support for maintaining the option of a less expensive hiker shelter at Granite Park (which would require a less complex utility system) in contrast to the full services option at Sperry Chalet.

- **Shower and Laundry Facilities**

The existing shower facilities at Rising Sun and Swiftcurrent are heavily used throughout the summer season. There are no public showers inside the park on the west side, although there are public showers approximately six miles from the park entrance. This distance is an inconvenience for some visitors who do not have transportation. There is only one public laundry facility inside the park on the east side at Swiftcurrent.

- **Other Support Services for Concession Operations**

Support services are lacking, namely laundry facilities, warehousing and administrative offices for hotel, motel and lodge operations in the park. The concessioner that operates most of the overnight facilities in the park provides these functions from Glacier Park Lodge in East Glacier. Although Glacier Park Lodge is owned by the current concessioner, it is not part of the concession operation of Glacier National Park. A new concessioner may need to locate other facilities.

- **Modernization or Expansion of Developments**

Important defining features of the park are its natural environment and historic rustic character. The public commented that existing facilities should be rehabilitated, but that modernization or expansion should be kept within the developed areas. Additionally, the public stated that there should be a range of accommodations available to offer options for visitors from different income levels.
- **Commercial Group Hikes.**

Concerns were raised about the increasingly large size of guided hiking groups by concessioners. Large groups may disturb vegetation by leaving the trail for breaks or to allow others to pass and by occupying a large area at destinations. Large groups may impact other hikers by making it more difficult to pass and by producing unacceptable levels of noise. There are currently no limits on group size for commercial day hiking groups. Concessioner-led trips with 20 to 40 participants are not uncommon.
- **Commercial Bicycle Tours**

Concerns were raised about the increasingly large size of guided bicycle tour groups on the Going-to-the-Sun Road, the frequency of multiple groups on the road at the same time and the hazards of conflict with motor vehicles on the narrow road. Rest stops by large bicycle groups, parking for support vehicles, and the slower moving uphill bicycle traffic compete for road access and limited parking along the road. In the past ten years, the number of commercially guided tour operators has increased from 5 to 11 with an average of over 550 bicyclists visiting Glacier National Park each summer. Some participants commented during scoping that restrictions on the numbers, days or hours for group bicycle tours should be set to reduce potential conflicts.
- **The Construction Season**

Closing visitor facilities for rehabilitation during part or all of the visitor season may affect the visitor experience and concessioner business opportunities; but allowing construction during the off-season might affect sensitive wildlife, including the park's threatened and endangered species.

ISSUES AND NEW SERVICES CONSIDERED BUT BEYOND THE SCOPE OF THIS PLAN

- **Parkwide Transit System**

This system is necessary and appropriate in the park but is not included in this planning effort. The rehabilitation schedule of the Going-to-the-Sun Road (GTSR) may extend from seven to 20 years, depending on the final decision of the *Going-to-the-Sun-Road Rehabilitation Plan/Draft Environmental Impact Statement (GTSR Plan/Draft EIS)* process. As part of the *GTSR Plan/Draft EIS*, a temporary transportation system on the road was proposed to ensure public access to the park during the road's rehabilitation. It will also provide the opportunity for the park to experiment with different buses, schedules and incentives. Depending on their success, various features could be part of a more permanent system after the rehabilitation effort is complete. It was also recognized that planning a system that would not be implemented for at least seven to 20 years is not realistic. The industry is constantly changing and there may be an opportunity to connect with a regional transportation system that has not yet been developed by the surrounding areas. Therefore, a more permanent parkwide transit system will be addressed at a later time.
- **Utility Upgrades and Improvements at Developed Areas**

The utility systems (water, wastewater and fire protection) at Apgar, Two Medicine, Lake

McDonald, Rising Sun and Many Glacier require upgrades and improvements that are not analyzed in this plan. These improvements are being designed and analyzed individually for these areas as funding is obtained. The Apgar water and fire service was analyzed in an environmental assessment released in the spring of 2002 and a finding of no significant impact was signed in May 2002. Construction will begin in the spring of 2003.

• **Funding Rehabilitation of Historic Buildings**

Some of the public is willing to pay a use fee to support funding the rehabilitation, others are concerned that increased park fees, other services and lodging would become unaffordable to some of the visiting public. Although comments have suggested using either private funds or a percentage from concessioners’ revenues to finance rehabilitation, many support use-tax revenues to avoid private interest investments by concessioners. While funding is critical to the implementation of this plan, actual funding mechanisms will be determined outside of this planning effort.

• **Concessioner’s Possessory Interest**

Concessioners acquire ownership interest (referred to as “possessory interest”) in park facilities through investments in the original construction or improvements. By law and contract, if they are not selected for the succeeding concession contract, the concessioner is entitled to compensation for their possessory interest from the government or a successor concessioner. During scoping, suggestions were made that the government should buy out the concessioner’s possessory interest. This buy-out would reduce the initial investment any potential competitors would need to make when competing for the new contract and increase the likelihood of a broader field of qualified applicants. While this suggestion has merit, the decision to seek and the ability to obtain funding to buy out possessory interest would occur outside the scope of this planning effort.

Another issue raised during scoping was the fear that the concessioner’s possessory interest was being increased by government investment in repairs to the Many Glacier Hotel. The current concession contract requires that the value of the possessory interest be adjusted downward in an amount equal to the investment made by the government, thereby reducing the value of the possessory interest. For example, if the government invested \$2 million in repairs, the concessioner’s possessory interest would be reduced by \$2 million. These issues would be determined by contract, funding allocations or other actions at management’s discretion and are considered outside the scope of this plan.

• **Other Services and Uses**

The services listed below were determined to be necessary and appropriate in the park. However, they are not discussed under this plan because their activities are not considered commercial services for the purposes of regulation under concessions contracts or commercial authorizations. They operate under separate operating agreements.

- **The Glacier Natural History Association and Glacier Institute** operate under cooperative agreements with the National Park Service. The goals of these cooperating associations are consistent with the purposes and values of the park and with park policy.

They achieve these goals by offering educational programs that enhance the quality of the visitor experience and promote appreciation (and therefore protection) of park resources. Cooperating associations promote visitor understanding and appreciation of the park’s mission and values by the publication

Cooperating
associations promote
visitor understanding
and appreciation of
the park’s mission
and values

and sale of books and other educational materials about the park. (The proceeds from sales support the park mission, especially educational efforts.)

- **Commercial Filming and Photography:** Commercial filming and photography projects are examined to ensure that no adverse resource or public value impacts will occur before a permit is issued. The National Park Service ensures that these services do not unduly conflict with other park uses or with activities outside the park, nor do they preclude the public from enjoying recreational opportunities. Nature films and photography can complement the fundamental experiences of park visitors and serve to interpret and educate the public about park resources.
- **Special Events:** Special events are defined as recreational activities that are proposed as organized events or events that involve commercialization, advertising, or publicity by participants or organizers. They are managed in accordance with the criteria and procedures in NPS-53, Special Park Uses.
- **Commercial Air Tours**

These tours are not addressed in this plan. The Federal Aviation Administration (FAA) regulates aviation throughout the United States, including the airspace above national parks. Legislation requires that the FAA (assisted by the National Park Service) prepare Air Tour Management Plans for each park area that has scenic air tour activity.
- **Accessible Facilities in Campgrounds and Other Areas**

The public expressed an interest in having more accessible restrooms and visitor facilities throughout the park. While improving accessibility of facilities in the park remains a goal for park management and is occurring as funding allows, non-commercial facilities are beyond the scope of this plan.
- **Monopolies Held by Concessioners**

There was some public concern about assigning the rights to only one concessioner for providing specific services. When the National Park Service establishes a concession opportunity, it evaluates the financial feasibility of the opportunity given the capital investment required and the obligations assumed under the contract. The limited nature of some opportunities makes more than one concession contract economically infeasible. The park must also manage resource impacts. Decisions related to the appropriate number of operators are therefore considered beyond the scope of this planning effort and will be made during the contract development process.
- **Economic Opportunities for Blackfoot Tribal Members**

The high unemployment and limited economic opportunities on the Blackfoot Reservation that borders Glacier National Park to the east are of particular concern. However, while many of the services that are identified in the plan are potential business opportunities for the park's neighbors, the National Park Service does not have the legal authority to contract exclusively with any one population for these services. While the park will continue to provide employment opportunities to individuals and concessioners will continue to be encouraged to hire locally, developing economic opportunities specifically for the Blackfoot Tribe is beyond the scope of this planning effort.
- **Paintings and Collectibles Owned by Concessioners**

The current primary concessioner in Glacier National Park owns many works of art from the early days of the park and displays them in the hotels and motels around the park. Concern was raised during scoping that these works should be inventoried and acquired by the National Park Service

so that the works remain in the park. While the Park Service is interested in ensuring that these privately owned works remain in the park, any agreements to acquire or establish a tie with the works are beyond the scope of this planning document. Pursuant to the current contract, all personal property owned by the concessioner (including these works of art) would be transferred to the next concessioner at the end of the current contract.

- **Private Lands in the Park**

Currently, there are commercial activities occurring on privately owned lands within Glacier National Park. There is the potential for change on these lands, and for more commercial activities and related building, particularly in the Apgar area. Commercial activities on private lands are not considered to be concessions and are subject to different permitting regulations. Private land use changes are reviewed under different regulations and policy, and fall under the guidance of the Land Protection Plan (NPS 1985b). Because of these differences, it was decided that commercial activities and building on private lands would fall outside the scope of this planning effort.

- **Rehabilitation of Campgrounds**

The campgrounds located throughout the park (many of which are in developed areas discussed in this plan) require rehabilitating and updating. Because campgrounds are National Park Service rather than commercial service facilities, these needs will be addressed by the park under its cyclic and routine maintenance as money becomes available.

- **Day Hiking Party Size**

Party size determinations for the general public on backcountry trails and party sizes of National Park Service naturalist-led hikes are beyond the scope of this planning effort because these activities are not commercial services. They would be addressed upon the revision of the Backcountry Management Plan.

SUMMARY OF RELATED PLANS AND PROJECTS

The following plans and projects are either planned, have begun or are completed. They are described to provide a better understanding of park development activities.

- ***General Management Plan for Glacier National Park*** (NPS 1999). This plan was completed in 1999 and provides overall guidance and direction for the park.
- ***Assessment of Condition and Historic Contexts of Facilities at Seven Concessioner Locations in Glacier National Park*** (NPS 2002c). This report provides an architectural/engineering assessment of all the facilities in each area. It includes an historic structures analysis for the Many Glacier, Swiftcurrent, Two Medicine, Lake McDonald and Rising Sun areas; and an overview of the cultural landscape at the Many Glacier, Swiftcurrent and Two Medicine areas.
- ***Cultural Landscape Report for the Going-to-the-Sun Road*** (Renewable Technologies, Inc. 2002). This report includes the cultural landscape overview for Lake McDonald and Rising Sun.
- **Rehabilitation of the Many Glacier Hotel.** Stabilization of the Many Glacier Hotel, Phase I, began in the fall of 2001. Phases I and II were funded to stabilize the foundation, begin rehabilitating the exterior of the building (siding, windows, door and roofing) and improve fire egress. Phase II began in fall 2002 and Phase III will begin in fall 2003. Additional work (Phases IV- VII) is still needed to complete the exterior and address rehabilitating the interior of the



building, remaining code compliance issues, accessibility and life safety issues. These additional phases have not yet been funded.

- **Boat Dock Improvements.** A currently funded project continues the park's efforts to replace aging boat docks. In 2003, an upgrade to the dock and access trail at Lake McDonald Lodge, and dock improvements at Apgar and Goat Haunt will begin. The docks are being designed to allow better access for the physically challenged. Additional docks will be upgraded as funding allows.
- **Going-to-the-Sun Road Rehabilitation.** The *Going-to-the-Sun Rehabilitation Plan/Draft Environmental Impact Statement* (NPS 2002a) was released in September 2002 to analyze alternative ways to complete the required rehabilitation of the Going-to-the-Sun Road, accomplish site improvements for visitors along the road and provide a temporary transit system during the rehabilitation.
- **North Fork Study Area: Management Plan** (NPS 1992). This plan provides management and development needs for the North Fork area. It states:

Concession operations in the North Fork area will be limited to the existing backcountry guide service, and there will be no increase in the scope or level of this service. Maintaining the existing guide service is important because the North Fork backcountry is an integral part of backcountry tour experiences in the park, which generally involve long routes that may cross through the North Fork area. Expanding concession operations is considered unnecessary and inappropriate given the area's tradition of self-sufficient visitor use.

Since this plan was determined to be consistent with the General Management Plan (NPS 1999), the commercial services plan does not consider more concession services in the North Fork.
- **West Side Discovery Center.** The General Management Plan made the decision to construct a West Side Discovery Center to provide information and education to park visitors as they enter the west side of the park. The park is seeking funding to begin the design and construction process. The site design prepared as part of this plan for Apgar assumes the West Side Discovery Center will be located north of the T intersection as described in the General Management Plan, between Apgar Village and Apgar campground.
- **Ongoing Concession Facility Improvements.** The repair and maintenance of concession facilities will continue. However, the level of capital improvements is limited to available funding by the concessioner or other funding sources available to the park.
- **Lake McDonald/Park Headquarters Wastewater Treatment System Rehabilitation and Water System Rehabilitation for Park Headquarters and Apgar.** These projects will begin in spring and fall of 2003.
- **Repair and paving of existing roads and parking lots.** This project will begin in Apgar in fall 2003.



Chapter 2 Alternatives





Chapter 2 Alternatives

INTRODUCTION

This chapter describes the alternatives and the assumptions that guided their development. It includes a vision for commercial services, a definition and list of necessary and appropriate services, a description of management zones, standards and prescriptions for each service, operating dates and developed area objectives. Alternatives for necessary and appropriate services that are not restricted to a specific geographic location in the park are described, as well as alternatives for commercial services related to facilities within the park's developed areas (Apgar, Lake McDonald, Rising Sun, Two Medicine, Many Glacier and Swiftcurrent).

Actions that are common to all, as well as other alternatives and ideas that were considered but rejected are discussed. Summary tables of the alternatives and impacts are at the end of this chapter.

PLANNING ASSUMPTIONS

VISION FOR COMMERCIAL SERVICES

Glacier National Park's commercial operators, or concessioners, assist the Park Service in providing for visitor use and enjoyment while at the same time preserving the park's unique resources for future generations. Through cooperation with each other and all park neighbors, concessioners offer memorable, high quality experiences that provide opportunities to understand, appreciate and enjoy the park in its classic western park setting. They ensure that visitors enjoy a reasonably safe experience, augmented by educational opportunities that expand appreciation of the park's natural and cultural resources and its role in our national heritage. Concessioners are part of the park's celebration of the ongoing peace, friendship and goodwill among nations and recognition of the need for cooperation in a world of shared resources.

Most of the commercial facilities are part of the rich cultural heritage and significance of the park — many are either national historic landmarks or are listed in the National Register of Historic Places. The park's unique character and associated experiences are maintained, and necessary and appropriate services that complement the park and its individual developed areas are provided.

All commercial services in the park would:

Be Resource-Oriented

Commercial services complement, protect and preserve park resources at the same time that they facilitate and support the visitor experience. The theme, aesthetics and style of all commercial endeavors and facilities are in accord with the natural and cultural environment of the park. Their role in the visitor experience is supportive, unobtrusive and in harmony with park resources.

Rather than serving the maximum possible number of visitors, commercial services support visitation levels that are consistent with the preservation of resources and a high quality visitor experience. This level of visitation minimizes impacts to natural and cultural resources like vegetation and historic buildings. Sustainable practices are promoted such as recycling, reduced solid waste, the minimal use and safe disposal of hazardous materials, and the use of environmentally friendly building materials.

Provide Quality Service and Experiences

Historic visitor facilities are rehabilitated and provide a setting for quality service and experiences that reflect the unique historic character of the park. The architecture of other commercial structures is compatible with the geographic area and evokes a sense of place.

Commercial services that provide guided interpretive, educational or other informational narrative would promote park themes and expand the visitor's knowledge and understanding of the park's unique qualities. Presentation should be patterned after National Park Service standards.

The quality of all visitor experience is enhanced by minimizing conflicts between all groups who use the park through facility design, allocation of use and carefully conceived operating plans for commercial services.

A variety of visitor services and accommodations serve a range of visitor needs and incomes with approximately 500-540 lodging units parkwide (excluding chalets and private services in Apgar). There is no significant change in the percentage mix of type of accommodation from the present and services that are provided by surrounding communities are not duplicated.

Optional commercial transportation that is convenient, affordable and of high quality provides access to the park. Transportation systems provide seamless connections between the park, gateway communities and regional transportation systems. All systems service visitors with a variety of needs and enable travelers to enjoy freedom of movement. The historic "red bus" experience is maintained as an option for touring the park.

Commercial services complement, protect and preserve park resources at the same time that they facilitate and support the visitor experience.

Be Located in Well-Maintained Infrastructure

Well-maintained infrastructure and facilities support the approved level of commercial services, including employee and administrative facilities, parking, roads and utility systems. Historic visitor facilities are rehabilitated and all facilities maintained appropriately to extend their useful life. Housing is constructed or upgraded to meet minimum housing standards. A variety of employee housing options including dormitories, individual accommodations and efficiency apartments suitable for couples or small families is provided to enable concessioners to retain a diverse, qualified staff. Sufficient on-site housing is

provided to ensure adequate staffing for visitor services. Size and location of support facilities is determined by need and potential impacts to the resources. Signage is adequate to orient and direct visitors around sites.

NECESSARY AND APPROPRIATE COMMERCIAL SERVICES

Both the 1916 National Park Service Organic Act and Title IV of the National Parks Omnibus Management Act of 1998 emphasize the conservation and preservation of park resources, while at the same time allowing their use and enjoyment by means that leave them unimpaired for the future. The Omnibus Act states:

It is the policy of the Congress that the development of public accommodations, facilities, and services in units of the National Park System shall be limited to those accommodations, facilities, and services that ... are necessary and appropriate for public use and enjoyment of the unit of the National Park System in which they are located; and ... are consistent to the highest practicable degree with the preservation and conservation of the resources and values of the unit (PL.105-391).

The Organic Act, the statements of park purpose and significance and the park's General Management Plan together form the basis for the determination of "necessary and appropriate" criteria. All commercial services operating within Glacier National Park must meet these criteria. (See Appendix 1 for a complete discussion and evaluation of the necessary and appropriate commercial services considered in this *Draft CSP and Draft EIS*.)

The list below describes necessary and appropriate commercial services that are currently available, as well as services that could potentially be offered in the future. (Services that were considered but did not meet the criteria for necessary and appropriate are listed under "Alternatives and Ideas Considered But Rejected.")

Existing Commercial Services Considered to Be Necessary and Appropriate for the Park

Boat and Equipment Rentals	Guided Cross-Country Skiing/Snowshoeing
Boat Tours	Guided Day Hiking
Commercial Entertainment Offered Within Concession Facilities (plays, movies, concerts)*	Guided Horseback Riding
Cooperative Associations (Glacier Natural History Association and Glacier Institute)	Guided Interpretive Vehicle Tours and Public Transportation
Emergency Road Services	Guided Photography Workshops
Food/Beverage/Catering Meals	Guided Rafting
Granite Park Chalet	Horse Boarding
Guided Art Seminars	Horse Packing Services
Guided Backpacking	Lodging
Guided Bicycle Tours	Public Laundry
	Public Showers
	Retail/Vending/ATM
	Sperry Chalet

*Commercial entertainment outside concession facilities and other special events would continue to be regulated by management policies and special use permit requirements.



New or Enhanced Commercial Services Determined to be Necessary and Appropriate for the Park

Boat Transportation (water taxi)
 Firewood Sales
 Guided Natural and Cultural History
 Hikes**
 Guided Underwater Diving**
 Private Vehicle Shuttle**
 Step-on Guide Service**
 Guided Motorcycle Tours**
 Taxi Services

** New services that are not currently offered

STANDARDS AND PRESCRIPTIONS

Prescriptions or standards have been described for each necessary and appropriate commercial service. The prescriptions/standards describe how concessioners can achieve Glacier National Park's vision for providing quality visitor experience and services.

The standards are based on a comprehensive evaluation of the commercial services including opportunities beyond park boundaries. They establish specific performance expectations (for example, minimizing impacts on resources) for each type of commercial service. (See Appendix 2 for a discussion of prescriptions and standards.)

MANAGEMENT ZONES

The General Management Plan divided the six geographic areas of the park into conceptual management zones that include a visitor service zone, day use zone, rustic zone and backcountry zone. This commercial services plan refines the delineation of the visitor service zones. (See Appendix 3 for maps of the visitor service zones.)

ALTERNATIVES FOR NECESSARY AND APPROPRIATE SERVICES

The alternatives for necessary and appropriate services, and services related to the developed areas are presented below. Alternative A for both types of services is the "status quo/no action" alternative (and would be the only available choice in the absence of a plan). Actions that are common to all alternatives, as well as other alternatives and ideas that were considered but rejected are discussed at the end of the chapter.

GRANITE PARK CHALET

Alternative A – Status Quo/No Action

This alternative would maintain the current hiker shelter operations at the chalet. The chalet would continue to provide overnight accommodations for up to 37 guests per night. Bedding would be available as an option. No meals would be provided, however, guests could use the kitchen facilities to prepare their own meals. Guests would bring their own food, water and cooking utensils. No potable drinking water would be provided at the chalet. Concessioner housing for two to three employees would continue to be provided.

Alternative B (Preferred)

The chalet would continue to be operated as a hiker shelter and accommodate all the services currently provided in alternative A. In addition, this alternative would replace and expand the restrooms and provide potable water.

Specific actions would include: repair the existing infiltration gallery, replace the water line in the existing trench, repair or replace the pump house and chlorination building, replace the water tank and enlarge or replace the toilet facilities. Improvements would be made in accordance with Montana Department of Environmental Quality standards.

Alternative B was selected as the preferred alternative because it has fewer environmental impacts, allows for needed improvements to the toilet facilities and provides a range of opportunities for the public to experience the chalets. Sperry would continue as a full-service facility. Granite Park would provide a lower cost service and potable water.

Alternative C

The chalet would provide full-service dining and overnight facilities to guests that would be similar to the level of services currently provided at Sperry Chalet (linens and meals). Concessioner housing for up to eight employees would be provided. A new gray water system for the treatment of wastewater would be constructed and an improved toilet system installed. This alternative is consistent with the decision made in 1993 to reopen both chalets with full services. The decision is being reexamined through the commercial services plan because of new information gained from rehabilitating the system at Sperry Chalet about the potential impacts and the interest shown by the public in reconsidering this option. (See “Public Involvement and Issues to be Addressed by the Plan” in Chapter 1 for more information.)

GUIDED DAY HIKING (CULTURAL HISTORY/NATURAL HISTORY/RECREATIONAL)

Alternative A – Status Quo/No Action

Commercially guided day hiking would continue to be provided in all management zones except for the North Fork on trails. Although the client-to-guide ratio is currently regulated by an operating plan, there would continue to be no limits on group size or which trails could be used. No guided off-trail hiking, climbing, or fishing would be allowed. No administrative facilities are currently provided in the park.

No authorization for cultural and natural history hikes has been issued.

Interpretive hikes provided by boat concessioners and National Park Service naturalists would continue to be offered at no additional charge in conjunction with selected boat tours; however, group size limits would be set at 50 people for interpretive hikes led on Grinnell Lake, Grinnell Glacier and St. Mary Falls trails. This limit would accommodate all passengers potentially on the boat tour.

Alternative B (Preferred)

Commercially guided day hiking, including cultural/natural history and recreational hiking, would be provided in all areas of the park on trails, except the North Fork management area. Client-to-guide ratios would not exceed one guide for 11 clients. Interpretive hikes would continue to be provided by boat concessioners as described under alternative A.

For commercially guided hikes, a 12-person group size would apply to trails in the backcountry zone. In the day use zone, larger commercially guided groups would be permitted on trails. The group size limits were derived from park experience, the zone prescriptions in the General Management Plan and recreational literature, and would ensure a high quality experience.

Trail	Permitted Group Size
<u>Many Glacier area</u>	
Iceberg, Red Rock and Cracker Lakes	25
Grinnell Lake and Grinnell Glacier	35
<u>Goat Haunt-Belly River area</u>	
Waterton Lake and Rainbow Falls Trails	35
<u>Going-to-the-Sun Road Corridor area</u>	
Rocky Point	25
Sacred Dancing Cascade/McDonald Falls/Johns Lake	35
Sperry Chalet	35
Avalanche Lake.....	35
Highline Trail	25
Sun Point to Baring Falls.....	35
St. Mary Falls Trail.....	35
Red Eagle - Beaver Pond Loop.....	35
<u>Two Medicine area</u>	
Upper Two Medicine Lake	35
Rockwell Falls.....	25
Paradise Point.....	35
Running Eagle Falls.....	35

A limit of one trip per day on trails in the backcountry zone would be imposed with no limits to other zones. An overall cap of 5,000 user days would be imposed on all trails parkwide for the year. A user day would be defined as one person (either guide or guest) on a hike each day. (Note: the average number of user days per year recorded for commercially led day hikes from 1995-2001 was 2,472). No new administrative facilities would be provided in the park for this service.

The same conditions would apply to guided natural or cultural history hikes. The user day cap would cover all types.

Placing limits on the size of groups hiking on trails begins to implement the General Management Plan and achieve the desired visitor experience. Hikers in the backcountry zone would have fewer encounters with other hikers than would hikers in the day use zone.

GUIDED UNDERWATER DIVING TOURS

Alternative A – Status Quo/No Action

No commercially guided underwater diving tours are currently provided in the park.

Alternative B (Preferred)

Commercially guided underwater diving tours could be offered in Lakes McDonald, Sherburne and Josephine, and Swiftcurrent, Two Medicine, Pray, Lower Two Medicine and St. Mary Lakes. All participants would be fully certified divers. Skilled interpretation of the park's submerged resources would be an integral element of the tours and would include interpretation of park purpose and significance, as well as the cultural and natural history of the area. No collection or removal of materials from the waters would be allowed. No administrative facilities would be provided in the park.

This alternative was selected as the preferred because it would offer a new experience and provide the visitor with increased understanding and appreciation of the purpose and significance of the park.

FIREWOOD SALES

Alternative A – Status Quo/No Action

Firewood sales would continue to be provided in local camp stores in the Apgar Village, Lake McDonald, Rising Sun, Swiftcurrent and Two Medicine developed areas. No on-site firewood sales would occur in the campgrounds.

Alternative B (Preferred)

Firewood sales could be provided in specific campgrounds in the visitor service zones. These could include Apgar, Fish Creek, Sprague, Avalanche, Rising Sun, St. Mary, Two Medicine and Many Glacier campgrounds. The appropriate method of onsite sales is yet to be determined, however, sales from a roving truck, from vending machines, or from onsite storage facilities during specific times of the day would be considered. Firewood sales could still occur in camp stores.

The preferred alternative is B because firewood sales in the campgrounds would provide a service that has long been requested by the public and could be managed in a manner that meets all the appropriate criteria.

PUBLIC SHOWERS

Alternative A – Status Quo/No Action

Public showers would continue to be provided to a limited extent in the Rising Sun developed area (one women's and one men's shower stall) and the Swiftcurrent developed area (four women's, three men's and one ADA-accessible unisex shower stall). The shower facilities at Swiftcurrent would also continue to serve as the restroom and shower facilities for the 26 guest cabins that do not contain private bathrooms. Shower facilities could be expanded within the existing facilities at those locations.

Alternative B (Preferred)

Additional shower facilities could be built at or near campgrounds in the visitor services zones, or existing public showers could be expanded within existing facilities. See site alternatives in developed areas for additional changes to shower facilities at Rising Sun and Swiftcurrent.

The preferred alternative would expand the current level of services that is inadequate and better meet the needs of the visiting public.

BOAT TOURS AND TRANSPORTATION (BOAT TAXI)

Alternative A – Status Quo/No Action

Interpretive boat tours would continue to be provided on Lakes Josephine and McDonald, and St. Mary, Two Medicine, Swiftcurrent and Waterton Lakes. One vessel would continue to provide these services on each lake with the exception of Waterton and St. Mary Lakes, where concessioners would continue to operate multiple vessels. Interpretive hikes provided by the concessioner and National Park Service naturalists would continue to be offered at no additional charge in conjunction with selected boat tours. There would continue to be no group size limit for these hiking activities. Boat taxi or boat transportation services would continue to be provided on the existing tour boats. A combination of boat docks and storage facilities, ticketing facilities, and concessioner employee housing would continue to be provided in the vicinity of the lakes in some areas. Concessioner housing for up to 27 employees would be provided.

Facilities would be upgraded to comply with life safety, accessibility and building codes as funding is available.

Alternative B (Preferred)

In addition to the services and upgrades provided in alternative A, services would be expanded to include tour boat pick-up at Apgar Village to replicate the original means of transportation to Lake McDonald Lodge. The present public boat dock would be extended 40 feet to allow the boats to dock safely. Adding a vessel at Lake McDonald and Two Medicine Lake could also expand services.



Interpretive hikes provided by concessioners and National Park Service naturalists would continue to be offered at no additional charge in conjunction with selected boat tours; however, group size limits would be set at 50 people for interpretive hikes led on Grinnell Lake, Grinnell Glacier and St. Mary Falls trails. This would accommodate all passengers on the boat tour. Tour boats would be modified as necessary to improve access for the mobility-impaired public. Additional taxi services by boat would be provided on St. Mary and Two Medicine Lakes as appropriate.

The preferred alternative provides more choices and opportunities for visitors with minimal impacts to park resources.

GUIDED INTERPRETIVE MOTOR VEHICLE TOURS AND PUBLIC TRANSPORTATION SERVICE

Alternative A – Status Quo/No Action

- **Motor Vehicle Tours**

Only two commercial tour or transportation operators are currently authorized to provide service on the Going-to-the-Sun Road between Lake McDonald Lodge and Rising Sun Motor Inn. No commercial operations are currently allowed in the North Fork management area with the exception of the Camas Road.

Currently, tours cross the park and provide links to Waterton, Canada; East Glacier, West Glacier, and on special request, Kalispell airport. One tour company, using a combination of 15-passenger vans and rehabilitated 1930s-vintage buses, provides commentary that describes park features, history and local lore. A second tour company uses a small fleet of big picture-window tour vehicles and interprets the park from a Native American perspective. Commentaries include local lore, history and discussions about the spiritual importance the park holds to the Blackfoot Tribe.

- **Taxi Service**

Current taxi services would continue to be provided to destinations within the park under authorization from the National Park Service. However, taxi services are not allowed in the North Fork, on the inside North Fork Road, or on sections of the Going-to-the-Sun Road between the Lake McDonald and Rising Sun developed areas. They are allowed on the Camas Road. Pre-existing contractual agreements preclude this type of service by other than a concessioner in the above-mentioned section of the Going-to-the-Sun Road. No administrative facilities are currently provided in the park.

- **Private Vehicle Shuttle**

The commercial shuttling of private vehicles is currently not provided in the park.

- **Public Transportation Service**

Current shuttle services would continue with point-to-point transportation between Many Glacier Valley and along the Going-to-the-Sun Road. The service consists of two 15-passenger vans, which are operated from morning until early evening between July 1 and Labor Day weekend. Headways (time between buses) would continue to range between two and three hours. The service connection to the Many Glacier area would continue to be very limited.

Alternatives for shuttle services will be identified and analyzed in a separate parkwide transit plan.

Alternative B (Preferred)

- **Motor Vehicle Tours**

Services would continue to be provided throughout the park with the exception of the North Fork management area. Tours would be allowed on the Camas Road.

- **Taxi Services**

Operations would continue as in alternative A until contractual agreements expire. At that time, operating restrictions would be changed to allow expansion of services.

- **Private Vehicle Shuttle**

The commercial shuttling of private vehicles would provide transportation of a park visitor's private vehicle to a designated location or trailhead to facilitate a hiking trip that begins and ends at different locations. Commercial shuttling of private vehicles could be provided to trailheads and designated locations in the Two Medicine, Many Glacier and Going-to-the-Sun Road corridor

management areas. This service would not be provided in the North Fork management area. No administrative facilities would be provided in the park.

- **Public Transportation Service**

A parkwide transit system would be provided. Alternatives for shuttle services will be identified and analyzed in a separate parkwide transit plan.

The preferred alternative would better meet the public's tour and transportation needs in and around Glacier National Park. It would provide more flexibility for visitors who choose long distance hikes without reliance on shuttle schedules.

HORSEBACK RIDING AND HORSE PACKING SERVICES

Alternative A - Status Quo/No Action (Preferred)

Stables offering guided trail rides on horseback would continue to be provided at Apgar, Lake McDonald and Many Glacier. Horse packing services would continue to be provided for public use and to deliver supplies to Granite Park and Sperry chalets on request. Day rides would continue to originate at the stables or, in the case of Many Glacier, from a designated site near the hotel.

"Drop trip" packing services, which deliver gear and supplies for visitors to designated backcountry destinations, would continue to be provided to any backcountry campsite where horse traffic is permitted.

Boarding of private horses is provided only at Many Glacier Stables as a mid-point overnight during a multi-day backcountry stock trip (i.e., the Continental Divide National Scenic Trail).

Client-to-guide ratios, group size limits and limits to stock numbers held at the stables for each ride or on specific trails each day would continue to be determined by an operating plan. (These limits currently include a 9-to-1 client-to-guide ratio; 20-horse group size; stock limits on the trails of 40 head at Many Glacier, 30 head at Lake McDonald and 25 head at Apgar; stock limits in the corrals of 45 head at Many Glacier, 45 head at Lake McDonald and 30 head at Apgar; and stock limits of 20 head on Sperry Trail and nine head on the Loop Trail.)

Concessioner housing for up to 33 employees would be provided between the three stables. Facilities at the existing stables would be upgraded to comply with life safety, accessibility and building codes as funding is available.

Alternative A is the preferred because it provides visitors with a good range of locations tied to historic usage at Apgar, Lake McDonald and Many Glacier without expanding the impacts of concession operations. It offers a broader opportunity than alternative B, avoids the increase in adverse environmental effects in alternative C, and provides a better economic opportunity and broader range of visitor opportunities than alternative D.

Alternative B

Service would be provided as described in alternative A with the exception of the Apgar stables. The Apgar stables would be maintained as a base for packing operations, but no trail rides would originate from that location, due to a history of declining demand for this activity from this site.

Alternative C

In addition to stables at Apgar, Lake McDonald and Many Glacier, guided trail rides would be provided in the Two Medicine and St. Mary areas. No facilities would be constructed or installed to facilitate these rides inside the park. All stock would be maintained outside the park and would be delivered to and from the park each day that rides are scheduled. Rides would be limited to the following trails: Dry Fork, Cut Bank, Red Eagle, Two Medicine (Mt. Henry-Scenic Point) and East Glacier Trails. These rides would occur only in July, August and September. Rides would be managed at one trip per day per trail, trail conditions permitting, with a total group size of ten horses including the guide.



Alternative D

Stables at Many Glacier and Apgar as described in alternative A would continue to operate. The Lake McDonald stables would be removed. The stable site would be used for trailhead parking and a stock-loading ramp. Rides or packing would only be permitted to Sperry Chalet from this location by stock transported from Apgar or outside the park. Housing could be retained at Lake McDonald or additional housing could be constructed at the Apgar stables. The corral at Apgar could be enlarged to accommodate 45 horses.

GUIDED BICYCLE TOURS

Alternative A - Status Quo/No Action

Commercially guided bicycle tours would continue to be provided in the visitor service zone of all management areas except in the North Fork management area because no commercial services are provided there, with the exception of the Camas Road. These services would also continue to be provided in the rustic zone of the Apgar Lookout, the 1913 Ranger Station and the Cut Bank area. Off-road bicycles would continue to be prohibited. There would continue to be no limits on group size, number of groups per day, or number of operators. Other conditions of operation would continue to be designated in a commercial permit. No administrative facilities are currently provided in the park.

Alternative B (Preferred)

This alternative would maintain the conditions outlined in alternative A, but would limit group size and the number of groups that could cross the Going-to-the-Sun Road per day. There would be an allocation system for the distribution of opportunities between operators.

Alternative B is preferred because commercial bicycle tours can range from groups of five to 100 cyclists, the limits on the size would be established to ensure a quality visitor experience on these tours and avoid conflicts between vehicles and bicycles. An allocation system would be developed to distribute opportunities among different bicycle tour groups.

COMMERCIAL STEP-ON GUIDE SERVICE

Alternative A - Status Quo/No Action

No commercial step-on guide services are currently provided in the park.

Alternative B (Preferred)

Commercial step-on guide services could be provided in the park. For this service, an individual who is skilled in interpretive techniques and who is knowledgeable about the park and its resources would ride along with park visitors in their own vehicles or with tour operators in commercial tour vehicles. The step-on guide would provide customized interpretive tours of the park for a fee. The services would not be authorized in the North Fork management area except for the Camas Road. No administrative facilities would be provided in the park.

This alternative is preferred because it offers the public a necessary and appropriate visitor experience that is not currently provided.

GUIDED MOTORCYCLE TOURS**Alternative A - Status Quo/No Action**

No commercially guided motorcycle tours are currently provided in the park.

Alternative B (Preferred)

Commercially guided motorcycle tours could be provided in the visitor service zones of all management areas of the park with the exception of the North Fork. No commercial tours are allowed in the North Fork with the exception of the Camas Road. Limits for group size and number of groups that could cross the Going-to-the-Sun Road per day would be established through an operating plan. An allocation system for the distribution of opportunities between operators would be developed if necessary. No administrative facilities would be provided in the park for these services.

This alternative is preferred because it extends an opportunity to a user group that is not currently provided.

APGAR VILLAGE DEVELOPED AREA



Apgar was first settled in the early 1890s on the shores of Lake McDonald. It is named for H.D. Apgar, one of the original homesteaders and entrepreneurs in the area before Glacier National Park was established. Apgar is the traditional point of entry to the park, located on the west side at the south end of Lake McDonald. Historically, before roads were built, it was the launching point for boat transportation to Lake McDonald Lodge farther up the lake. Apgar's original complex of simple log structures no longer exists.

The village's size, character, density, development, volume of traffic and range of available commercial services have evolved over the years. Today, its rustic village setting, small scale buildings and services that range from cabin accommodations to small retail stores contribute to the character of this traditional point of entry to Glacier National Park. The area between Apgar Village and the Apgar campground was selected by the General Management Plan as the location for the Discovery Center and public transportation staging area.

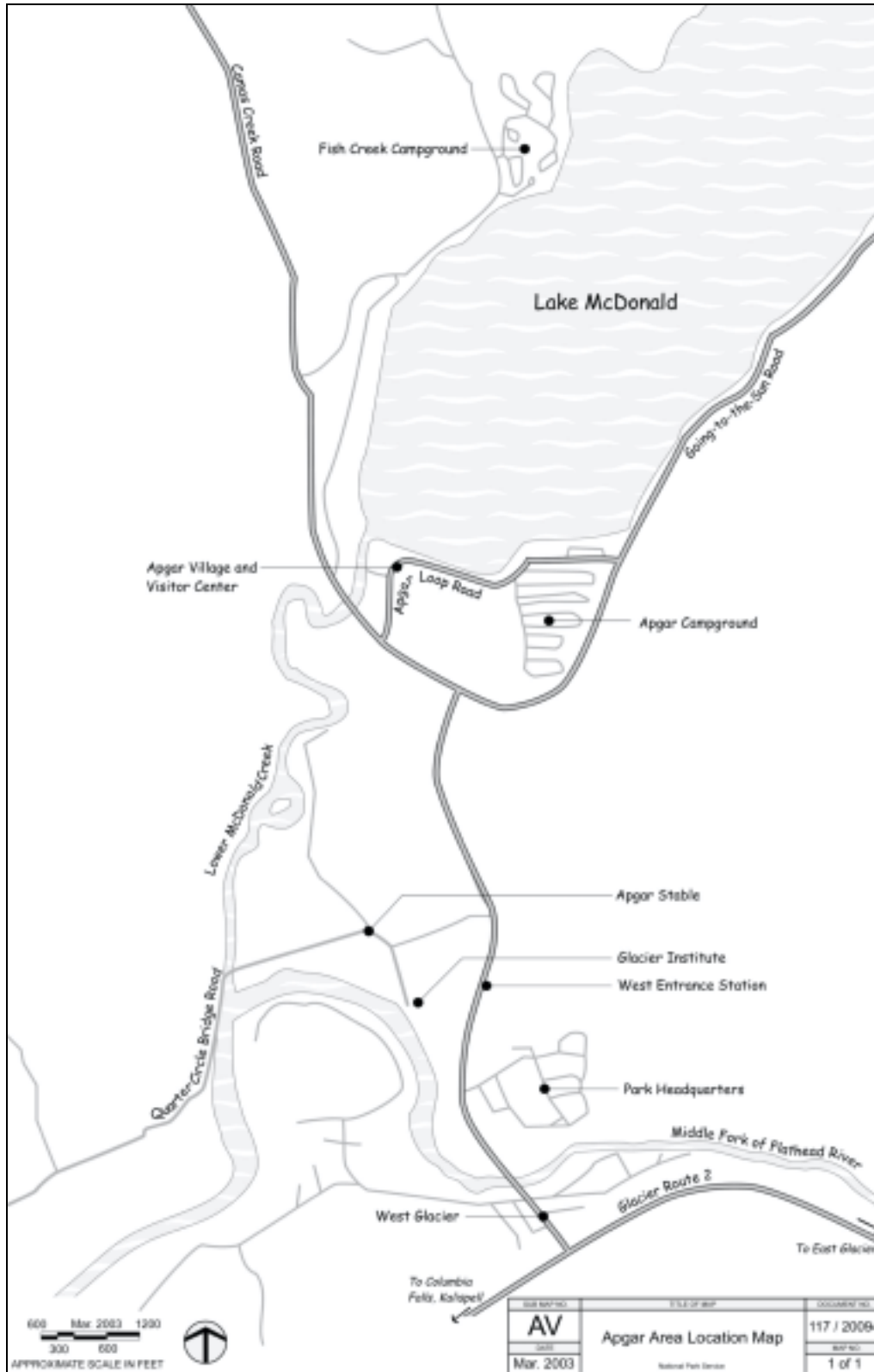
Many of the commercial services at Apgar are provided by private landowners on private lands within the boundary of the park rather than by National Park Service concessioners. The alternatives only address commercial development and services on federally owned land, and do not propose changes to privately held lands. The National Park Service believes that the scope and level of existing commercial facilities, with the additions considered in the alternatives, are adequate to meet the visitor needs of that area. The 1999 General Management Plan for Glacier National Park also states that although new or replacement development could occur in this area, subject to resource considerations, the area would be managed to accommodate the current levels and types of uses. As stated in the 1985 land protection plan for Glacier National Park, the National Park Service continues to have an interest in purchasing undeveloped lots in Apgar Village on a willing-seller basis.

Apgar possesses valuable environmental resources. To conserve those resources and enhance visitor use, site-sensitive alternatives were developed using the following site analysis.

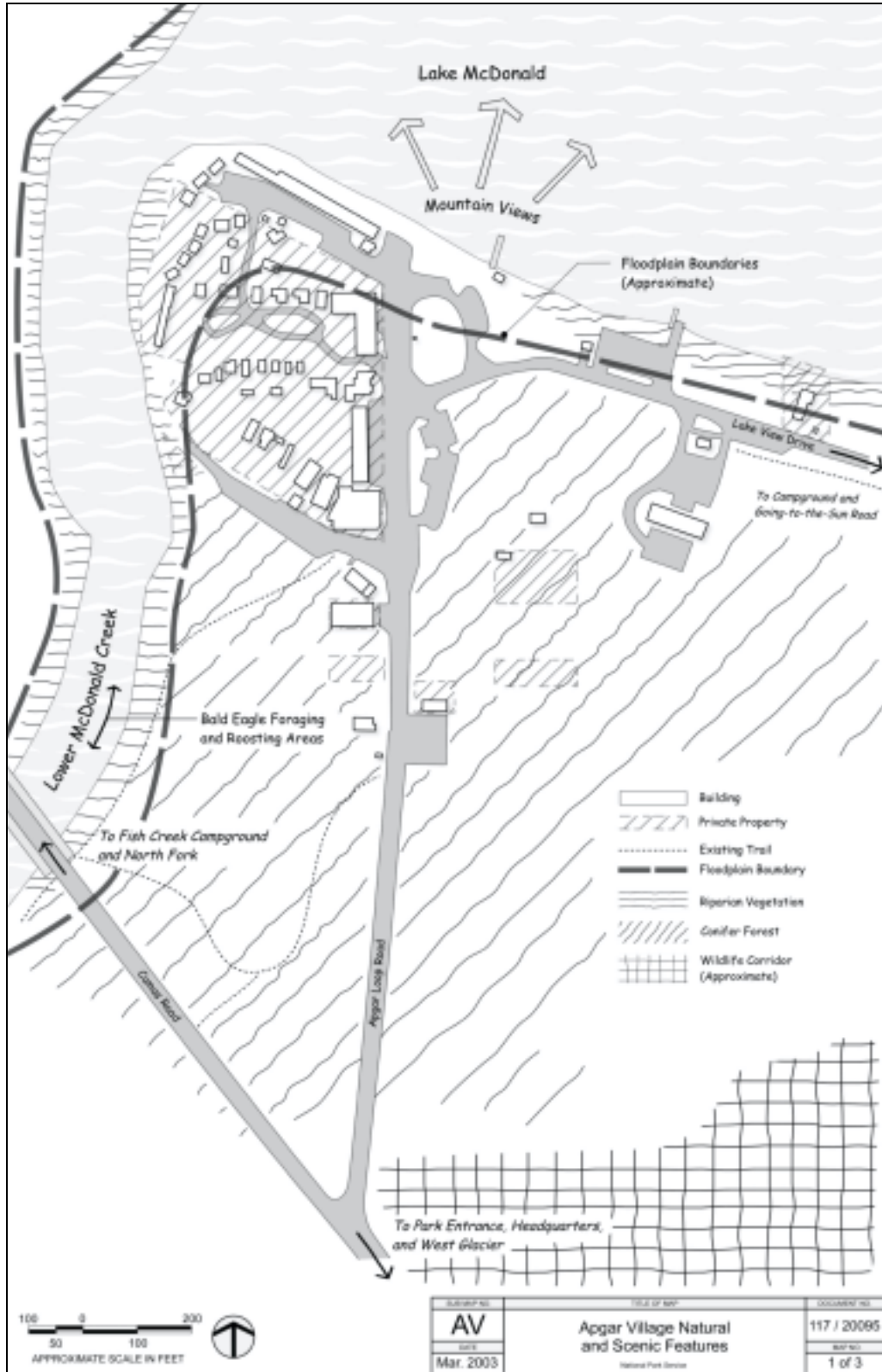
Apgar Site Analysis

Natural and Scenic Features

- *Topography and soil conditions:* The terrain is flat. Soils within the area consist mainly of gravel to loam, to sandy loam. Susceptibility to wave action has created an eroded shoreline that threatens the integrity of the Village Inn and presents hazards to guests.
- *Views:* There are significant views across the lake to the distant mountains. Views down Lower McDonald Creek offer possibilities for wildlife observation. Framed views to the north down the village main street focus on the lake. This view is partially obstructed by the lakeside Village Inn and vehicle parking. The development along the lakeshore is visible from across the lake and along the Going-to-the-Sun Road.
- *Weather:* Apgar Village services are usually closed during the winter, but the roads remain plowed for winter access. Most of the village is protected from lake winds by forest, except along the open shoreline.



MAP 2-1 APGAR AREA LOCATION MAP



MAP 2-2. APGAR VILLAGE NATURAL AND SCENIC FEATURES

- *Floodplain:* The entire Apgar development area can be considered to be outside the 100-year floodplain and within the 500-year floodplain.
In a 1964 event that was far in excess of a 100-year event, storm runoff raised the level of the Flathead River, causing Lower McDonald Creek to reverse its normal southern flow to a northward flow. The reverse created a flood that inundated the Village Inn, destroyed bridges, damaged private residences and flooded portions of the campground.
- *Vegetation:* Apgar Village is surrounded by dense coniferous forest in a mosaic created by the Half Moon Fire of 1929. There are pockets of old-growth trees and forest. Riparian vegetation grows along the shores of Lake McDonald and the streamside of Lower McDonald Creek.
- *Wildlife:* The village area provides productive habitat for nesting and feeding by many migratory and resident birds. It is also foraging and roosting habitat for bald eagles and a travel corridor for black and grizzly bears, ungulates and other wildlife. It is a wintering area for white-tailed deer. Gray wolves have been documented moving through the area. Bull trout inhabit Lower McDonald Creek and Lake McDonald, as do river otters and numerous waterfowl species.

(See Map 2-2. Apgar Village Scenic and Natural Features.)

Cultural Features

Apgar is a historically significant location as the site of one of the earliest developments at Glacier National Park. However, no structures are listed in the National Register of Historic Structures.

The cultural features are:

- *Buildings*
 - The Apgar school house (now a gift shop), privately owned
 - The backcountry permit office
 - National Park Service subdistrict office buildings
 - Other privately owned buildings in the Apgar Village area may be significant (*Historic Structures* and *Cultural Landscape Reports* were not done for Apgar).

Visitor Use

- *Activities:* The area offers visitor opportunities to boat, fish, swim, walk, picnic, bike, snowshoe, cross country ski, view wildlife and photograph the scenery. A concessioner also offers boat rentals.

Horseback riding services are offered by a concessioner from a horse stable located south of the village. A large clearing around the stables provides space for parking and trail ride organization. A concessioner-operated ticket booth is located in the village.

Hiking from Apgar Village follows the Lower McDonald Creek Valley with short loops on Apgar Mountain.

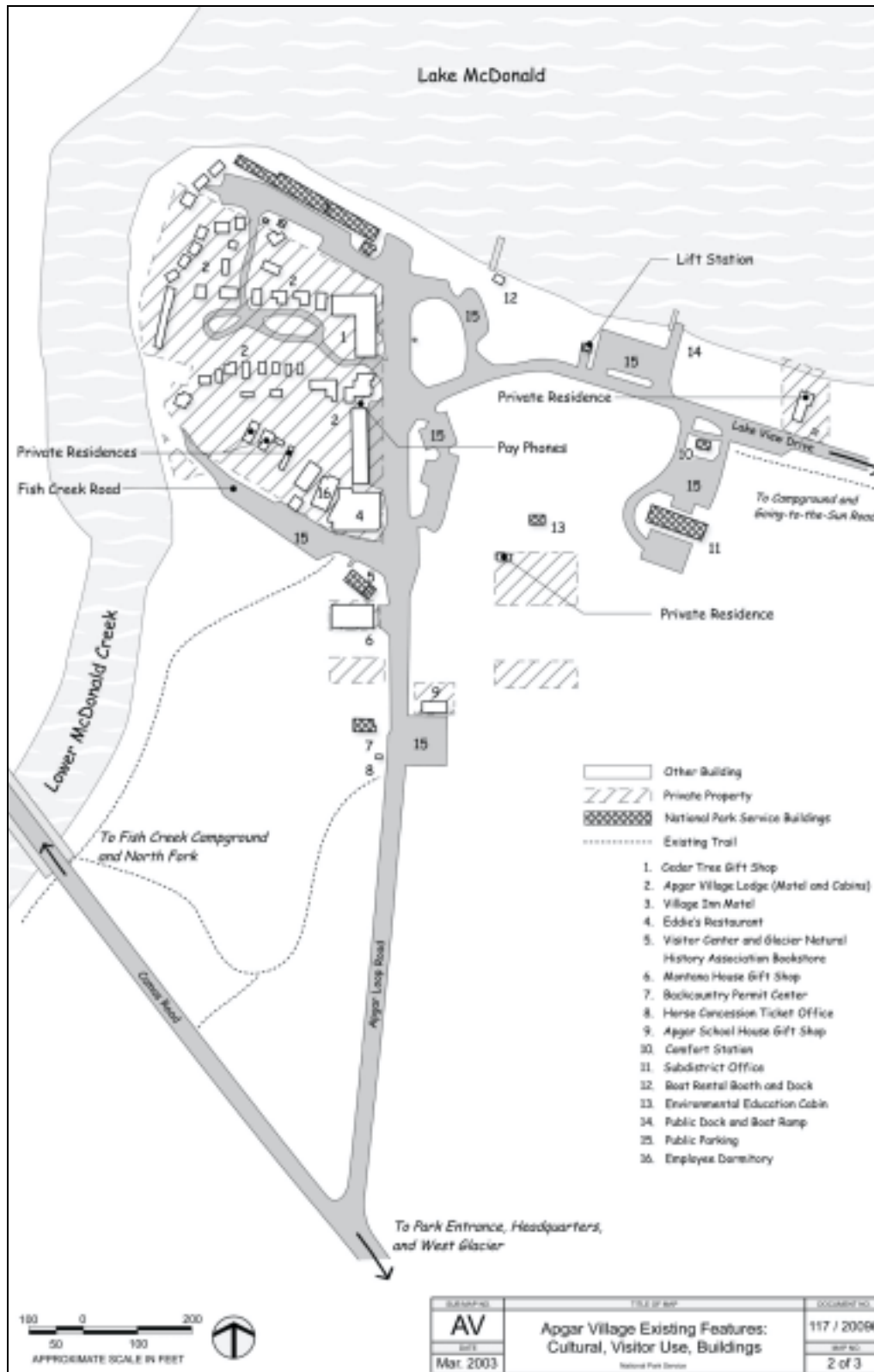
One trail is paved for bicycling between Apgar and West Glacier.

There are opportunities for wildlife viewing.

There are educational opportunities and a broad choice of overnight accommodations, including camping.

Dining opportunities include one restaurant, and other facilities are available a few miles away in West Glacier.

This location has the greatest variety of private stores and gift shops in the park. There are no shower facilities.



MAP 2-3 APGAR VILLAGE EXISTING FEATURES: CULTURAL, VISITOR USE, BUILDINGS

Circulation, Buildings and Utilities

- *Buildings:* There are a number of public services, commercial ventures and residences in and around the village: small park Visitor Center, Cedar Tree Gift Shop, Montana House Gift Shop, the Apgar School House Gift Shop, Eddie's Restaurant, General Store, Apgar Village Lodge, employee housing and private residences, horse concession ticket booth, boat rental booth and dock, environmental education cabin, a backcountry permit office, National Park Service Subdistrict office and the Village Inn.

In 2000, an assessment was conducted of the condition and code compliance of the Village Inn and associated buildings. The Village Inn shoreline would require stabilization to prevent further erosion from the front of the inn to Lake McDonald Creek. This improvement would also create an accessible route to the shore area from the inn's main entry points.

The inn would require upgrades of the secondary electrical distribution and fire alarm systems, installation of GFI outlets, and general renovation of the linen room including its roof. The balcony and stair railings would require modifications to meet new codes.

- *Circulation:* The village main street and a lakeshore drive that connects to the Going-to-the-Sun Road are the major circulation routes for vehicles. A circular drop-off and small parking area at the end of main street (adjacent to the lake) have access to most public activity areas. There is parallel parking along the sides of the road. Destination parking is available, but it is poorly designated. There is a lack of oversize vehicle parking throughout the village. The streetscape is generally congested due to vehicular circulation, parking and conflicts with pedestrians who are accessing local businesses and activities.

A bicycle/hiking trail connects the park headquarters area with Apgar and West Glacier.

(See Map 2-3 Apgar Village Existing Features: Cultural, Visitor Use, Buildings)

Apgar Site Alternatives

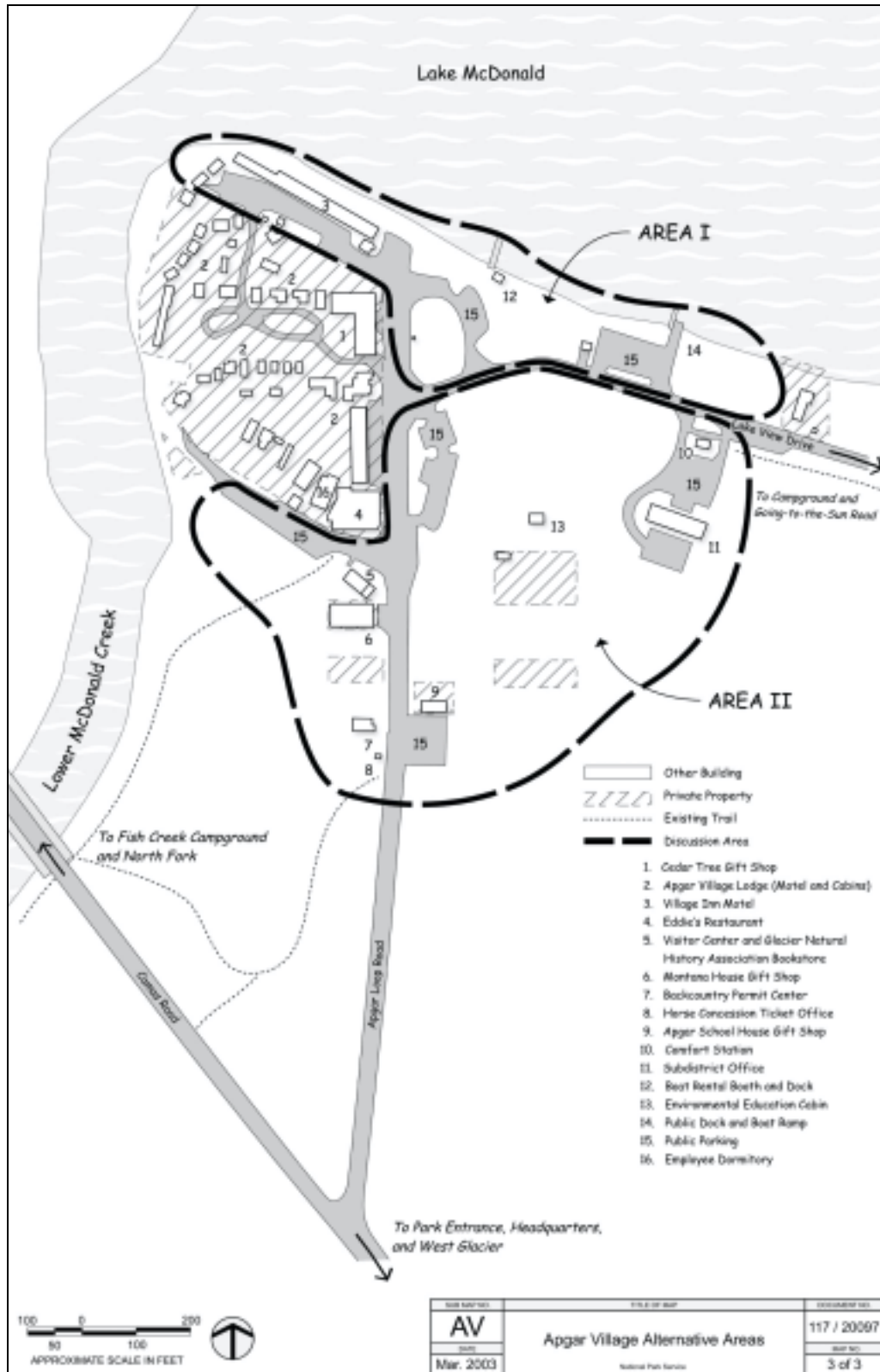
The goal is to maintain the rustic village atmosphere. As identified in the General Management Plan, a full range of visitor services in the Apgar Village would be provided by a combination of the National Park Service, concessioners and/or private businesses.

The overall objectives for the Apgar developed area are to:

1. Comply with life safety, accessibility and building codes.
2. Reinforce and maintain village character.
3. Promote pedestrian use of the area and separate vehicle circulation from pedestrian circulation.
4. Enhance the visitor experience by improving:
 - Existing visitor services,
 - Scenic views and pedestrian use of the shoreline,
 - Orientation, information and interpretive opportunities,
 - Sense of arrival.
5. Provide pedestrian access to the future site of the Discovery Center.
6. Stabilization of the Lake McDonald shoreline and visitor access.

Most of the commercial services at Apgar are provided by private landowners on private lands rather than by National Park Service concessioners. The alternatives only address development and services on federally owned land and do not propose changes to privately held lands.

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MAP 2-4. APGAR VILLAGE ALTERNATIVE AREAS

Alternative A (status quo/no action) would retain all existing services and facilities, but address life safety, accessibility and building code deficiencies. Improvements would provide another 25+ years of useful life. This alternative is also a component of alternatives B and C.

ALTERNATIVE A ACTIONS WOULD:

Area I

- Continue existing services:
 - Overnight guest accommodations
 - Limited employee housing and support facilities
 - Public boat launch and dock
 - Boat rentals and dock
 - Public restrooms and pay phones
 - Public shuttle and tours
- Stabilize the Lake McDonald shoreline.
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.

Area II

- Continue existing services:
 - Retail sales
 - Horseback riding reservations
 - Other non-commercial services such as Visitor Center and backcountry permit offices
- Construct new accessible trails and walks.

Outside Areas I and II

- These services are provided by businesses on private lands:
 - Retail sales
 - Food and beverage service
 - Employee housing

Alternative B (Preferred) would retain all the existing services and make improvements to the Village Inn. It would maintain the village character and continue to support a wide variety of commercial services offered by National Park Service concessioners and private landowners. Parking would be consolidated and expanded off of the main roadway. This would improve the lake views, and provide better oversized vehicle parking, and pedestrian and vehicle circulation. Pedestrian and bicycle trails would be improved.

ALTERNATIVE B ACTIONS WOULD:

Area I

- Include these services:
 - Overnight guest accommodations (concession)
 - Limited employee housing and support facilities
 - Public boat launch and dock
 - Boat rentals and dock
 - Public restrooms and pay phones
 - Public shuttle and tours
- Stabilize the Lake McDonald shoreline.
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Modify access to the Village Inn guest units for more privacy along the lakefront.
- Remove parking and create a pedestrian green space and path along Lake McDonald shoreline.

Area II

- Include these services:
 - Horseback riding reservations
 - Other non-commercial services such as Visitor Center and backcountry permit offices
 - Retail sales
- Construct new accessible trails and walks.
- Extend bicycle trail to campground.
- Formalize roadside parking on Apgar Loop Road and improve designated parking areas off the Apgar Loop Road.
- Provide additional oversized vehicle parking.

Outside Areas I and II

- Extend bicycle trail to campground.
- These services are provided by businesses on private lands:
 - Retail sales
 - Food and beverage service
 - Employee housing

Alternative C would retain all the existing services and include most of the improvements described in alternative B. In addition, the Village Inn would be removed and replaced in a different location away from the lakeshore. Landscaping, trails and seating areas would be added in its place, providing better public access to the shoreline.

ALTERNATIVE C ACTIONS WOULD:

Area I

- Include these services:
 - Public boat launch and dock
 - Boat rentals and dock
 - Public restrooms and pay phones
 - Public shuttle and tours
- Stabilize the Lake McDonald shoreline.
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Remove parking and create a pedestrian green space and path along Lake McDonald shoreline.
- Remove roadside parking from Apgar Loop Road and provide designated parking areas off the Apgar Loop Road.
- Remove the Village Inn and associated parking from the lakeshore. Rehabilitate for public access.
- Provide additional boat ramp parking.

Area II

- Include these services:
 - Overnight guest accommodations
 - Horseback riding reservations
 - Retail sales
 - Other non-commercial services such as Visitor Center and backcountry permit offices
- Construct new accessible trails and walks.
- Formalize roadside parking on Apgar Loop Road and improve designated parking areas off the Apgar Loop Road.
- Provide additional oversized vehicle parking.
- Construct new lodging (approximately 36 guest rooms) facilities and parking to replace the rooms lost from Village Inn removal.
- Remove Environmental Education Cabin. This service would be provided within the future Discovery Center.
- Extend bicycle trail to campground.

Outside Areas I and II

- Extend bicycle trail to campground.
- These services are provided by businesses on private lands:
 - Retail sales
 - Food and beverage service
 - Employee housing

See Appendix 2 for prescriptions and standards.
See Appendix 4 for additional information on existing and proposed services and facilities.

APGAR VILLAGE DEVELOPED AREA**Alternative B — Preferred**

The preferred alternative is B because removal of the Village Inn would not guarantee improved views across the lake and the costs of rebuilding the lodging at a new site compared to the benefits do not justify the expense. Although for many years the National Park Service has considered moving the Village Inn back from the lake and restoring the lakeshore, analysis has indicated that this action might have adverse effects that were not apparent years ago. The inn provides a buffer for wildlife that use Lower McDonald Creek.

Apgar Village
Preferred Alternative

LAKE MCDONALD DEVELOPED AREA



The development at Lake McDonald Lodge was part of the earliest effort to provide visitor services. The site is on the west side of Glacier National Park, at the north end of Lake McDonald and adjacent to Going-to-the-Sun Road (GTSR). Lake McDonald Lodge was originally constructed in 1914. Early visitors arrived by boat from Apgar and in 1920, a road was completed to the lodge. Overlooking Lake McDonald, the lodge offered some of the finest amenities available at the time and established a

tradition of service, comfort and interaction with the scenery and resources of the park. This early “resort” approach used architectural themes that contributed to the western character of the park and defined an experience that continues today. The Lake McDonald Historic District was listed in the National Register of Historic Places in 1978 and the lodge is a national historic landmark.

Services today include: lodging, food service, retail, horseback riding, boat rentals, boat and vehicle tours, public shuttle and general recreation. Additionally, the site links to the historic Sperry Chalet by trail through commercial horseback riding and hiking opportunities.

Like other park sites, Lake McDonald possesses a number of highly valuable environmental and significant cultural resources. To preserve these resources and enhance visitor use, site-sensitive alternatives were developed using the following the site analysis.

Lake McDonald Site Analysis

Natural and Scenic Features

- *Topography and soil conditions:* Lake McDonald is located in a glacial valley. The terrain at the lodge site gently slopes from the road to the lakeside. A steeper slope at the lake acts as a buffer between most of the development and the shoreline. Steeper slopes also rise to the east across Going-to-the-Sun Road and to the west across Lake McDonald.

Soils are variable and generally of two types and origins: fill deposits from glaciers with particles ranging from boulders to clay and boulders to sand, forming the alluvial fan of Snyder Creek. Topsoil throughout the area is very shallow.



MAP 2-5. LAKE MCDONALD NATURAL AND SCENIC FEATURES

- *Views:* From the shoreline there are unobstructed views of the lake and mountains, and most locations within the developed area offer distant mountain views. Trees and buildings filter the views of the lake from the interior of the site.
- *Weather:* Weather in the McDonald Valley is of the northern Pacific coastal type. Relatively high precipitation levels result in vegetation types more typical of coastal areas. Although in winter Lake McDonald Lodge is closed, it is the terminus for Going-to-the-Sun Road and the main parking area for winter recreational visitors on the park's west side.
- *Floodplain:* Lake McDonald Lodge, the Auditorium/Recreation Room Building, Snyder Hall, Cobb House, Boys' Dormitories 1 and 2, and the Johnson, Hydro and Jammer Dormitories are all located in the currently mapped 100-year floodplain from Snyder Creek. The floodplain problem is worsened by the existence of two nearby historic bridges that accumulate debris and unpredictably divert floodwaters; if the bridge becomes obstructed, the lodge will be flooded. However, flooding would occur regardless of the existence of the bridges.
- *Vegetation:* The Lake McDonald Lodge complex, located at the mouth of Snyder Creek, is surrounded by dense old-growth forest. Conifers dominate the uplands; the shoreline of Lake McDonald is particularly dominated by western redcedar. Black cottonwood, paper birch and willows dominate Snyder Creek.
- *Wildlife:* The inlet and delta of Snyder Creek where the lodge and other buildings are located provide productive wildlife habitat for numerous migratory and resident birds, bald eagle foraging and roosting, and ungulate winter range. The area is a travel route for various wildlife species including grizzly bears and mountain lions. Wildlife common to the area includes red and Columbian ground squirrels, snowshoe hares and white-tailed deer. Black bears, pine marten and elk are less common. Commonly seen birds include ravens, Steller's jays, barn swallows and robins.

(See Map 2-5. Lake McDonald Natural and Scenic Features.)

Cultural Features

Significant dates include the 1907 construction of several log cabins, the 1913-14 construction of the Lewis Glacier Hotel (Lake McDonald Lodge), the 1919 completion of the Transmountain Highway as far as the hotel and the 1933 initiation of the park's landscape plan (as part of the Glacier National Park Master Plan, October 1933) which included the boulevard.

The Lake McDonald Lodge, a national historic landmark, includes the hotel and outlying building complex. It was constructed between 1913-14 by private businessman J.E. Lewis, who employed the Cutter and Malgren architectural firm of Spokane, Washington to design a hotel with 65 rooms. (Lewis also built the log cabins; these structures are the oldest tourist accommodations at Lake McDonald.) Thomas Mahon, architect for Glacier Park Hotel Company, designed the General Store in 1937.

Buildings in the Lake McDonald Historic District are architecturally significant in their use of native materials. For example, the Cobb House was designed in 1918 by Fred Brinkman, AIA, of Kalispell, Montana, as Lewis' private residence. It is constructed of logs and stone and exemplifies the use of rustic style to create a western ambiance.



**MAP 2-6. LAKE MCDONALD EXISTING FEATURES:
CULTURAL, VISITOR USE, BUILDINGS**

The significant cultural features listed in the *National Register of Historic Places Inventory Nomination Form* are:

- *Landscape*
 - Boulevard and circular turnaround
 - Pathway adjacent to the lakeside of the cabin complex (promenade)
 - Undeveloped "green space" south of the boulevard
 - Going-to-the-Sun Road
 - Bridge over Snyder Creek (lower bridge of the original GTSR)
- *Buildings*
 - Lake McDonald Lodge
 - 14 cabins to the north of the lodge
 - Garden Court Dormitory
 - Cobb House Dormitory and garage
 - Snyder Hall Dormitory
 - Dispensary/Laundry
 - Caretaker's Residence
 - Auditorium/Recreation Hall
 - General Store
 - Horse Concession Cabin
 - Horse Concession Garage
 - Neitzling Cabin

Visitor Use

- *Activities:* In summer, a variety of outdoor activities are available to visitors. The area also offers the visitor opportunities to fish, swim, walk, view wildlife, photograph, picnic and lounge. Visitors can experience boat tours or rent small boats in front of the lodge.

There are hiking and equestrian trails to the east, in the direction of the Sperry Chalet. Trails are also available to Sprague Creek, Gunsight Pass, Sperry Glacier and Mount Brown. A large horse stable and corral are located in the woods across Going-to-the-Sun Road.

Winter activities include cross-country skiing and snowshoeing.

Choices of accommodations include the lodge and cabins.

Dining facilities include a Restaurant, Coffee Shop and General Store offering snacks.

Retail sales are offered by the gift shop at the lodge and at the General Store

Circulation, Buildings and Utilities

- *Buildings:* The restored Lake McDonald Lodge is a primary focus of the site. The original main entry to the lodge on the lakeside has been moved to the inland side to accommodate visitors arriving by automobile. A large outside patio is now on the lakeside with a flight of steps down to the lake. A publicly accessible trail and dock will be completed in 2004.

Exceptions to the strong, historic architectural character of the lodge and cabins are the Coffee Shop and Stewart Motel. The coffee shop is a 1950s contemporary style. The motel is an architecturally nondescript structure in generally fair condition.

There is generally poor separation between staff and visitor facilities on the site. The Garden Court and Girls' Dormitories 1 and 2, employees' indoor and outdoor recreation facilities, employee dining room, and outdoor seating are in the middle of visitor use areas, as are the caretaker's residence, maintenance shops and laundry. Some of these buildings are also in the floodplain.

In 2000, an assessment was conducted of the condition and code compliance of concessioner-operated buildings at the Lake McDonald Lodge area. Identified improvements would resolve structural issues in many dormitories and seismic requirements at the lodge, and repair exterior surface deterioration of cabins and dormitories.

The National Park Service has completed renovation of portions of the lodge. This same level of renovation for the remaining areas of the lodge, outlying cabins, dormitories and older support structures would be needed to prevent further degradation and preserve this asset that is more than 85 years old.

Most structures have deteriorating roofing. Needed improvements would be the installation of new wood shingle roofs; the replacement of the poor hot water piping system to the cabins; and the repair or replacement of wood railings, steps and guardrails that have deteriorated with age at the cabins, lodge and dorms. Resolution of ADA and safety issues with accessibility to lodging units would require removing obstructions and replacing poor surfaces. Improvements identified by the condition assessment would impact cabins, the Garden Court, Carpenter Shop, Snyder Hall and Cobb House Dormitory structures, as well as the lodge. Affected dormitories would require significant improvements to the interior walls, lighting, electrical system and exterior surfaces. A flood warning system would need to be developed.

- *Circulation:* There are three points of access from Going-to-the-Sun Road to the site. The primary access to the lodge is on the boulevard, which is a one-way loop road with adjacent parking, leading to a circular drop-off in front of the lodge. Previous traffic safety studies have recommended that the intersection at the boulevard and Going-to-the-Sun Road be redesigned.
- The tour buses use the lodge's circular drop-off as their turnaround for loading and unloading visitors.
- Garbage storage, and kitchen and linen service delivery are at the front of the lodge. The area is highly visible to visitors of the lodge. The staff also uses it for various activities, including outside employee dining.
- Handicap accessibility between Lake McDonald and Lake McDonald Lodge is a concern. A new trail will be under construction in 2003 to address this issue.
- Primary visitor parking is along the main entrance boulevard. There is additional parking at Stewart Motel, along the cabin service road, in front of the General Store and adjacent to the 1960s-vintage Coffee Shop. There are numerous pedestrian pathways that result in conflicts between pedestrian and vehicle traffic throughout the lodge area. Competing demands exceed the available parking.

(See Map 2-6. Lake McDonald Existing Features: Cultural, Visitor Use, Buildings.)

Lake McDonald Site Alternatives

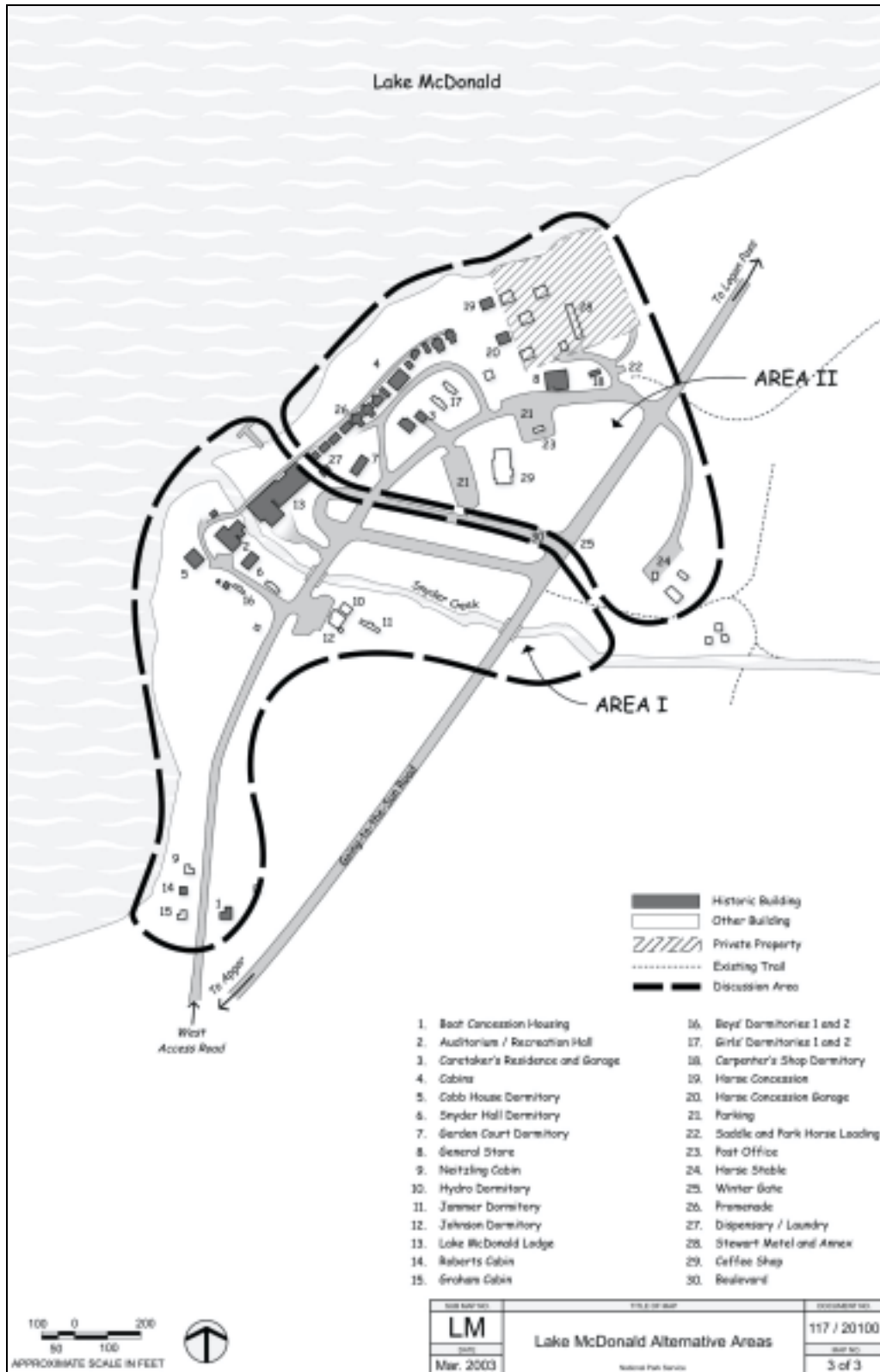
The goal is to maintain the historic character of this historic district and the Lake McDonald Lodge. As identified in the General Management Plan, a full range of visitor services would be provided by concessioners.

The overall objectives for the Lake McDonald developed area are to:

1. Comply with life safety, accessibility and building codes.
2. Preserve and maintain the historic resort character.

3. Promote pedestrian use of area; separate vehicle, pedestrian and equestrian circulation.
4. Enhance the visitor experience by improving:
 - Existing visitor services,
 - Scenic views and use of the shoreline,
 - Orientation, information and interpretive opportunities,
 - Sense of arrival,
 - Separation of guest and employee activities.
5. Improve employee housing and recreation.
6. Provide adequate parking.

The alternatives address only development and services on federally owned land, and on the privately held lands where the Stewart Motel is located, since the motel is operated as part of the Lake McDonald Lodge concession. Changes are not proposed for other privately held lands in the area.



MAP 2-7. LAKE MCDONALD ALTERNATIVE AREAS

Alternative A (status quo/no action) would retain all existing services and facilities, but address life safety, accessibility and building code deficiencies. Standard, high and deluxe overnight accommodations would continue to be provided in hotel, motel and multiunit cabins. Most employee housing would be provided on site. Improvements would provide another 25+ years of useful life. This alternative is also a component of alternatives B and C.

ALTERNATIVE A ACTIONS WOULD:

Area I

- Continue existing services:
 - Overnight visitor accommodations
 - Employee housing and support facilities
 - Maintenance support
 - Food and beverage services
 - Retail sales
 - Boat tours and rentals
 - Public restrooms and pay phones
 - Public shuttle and tours
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Remove debris from Snyder Creek to maintain a clear channel.

Area II

- Continue existing services:
 - Overnight visitor accommodations
 - Employee housing and facilities
 - Food and beverage services
 - Retail sales
 - Horseback riding
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.

Alternative B would retain services similar to the current operation. Facilities would be adapted to expand the types of overnight accommodations also to include hostel (budget), motel (standard), rustic lodge and multiunit cabins (high and deluxe). The exterior of the Coffee Shop would be modified to architecturally blend with the site. The historic Garden Court, and Cobb and Snyder Dormitories would be converted to guest accommodations to provide a broader range of experience. Substandard employee housing would be replaced with new housing that is outside of flood-prone areas and that better separates guest and employee activities. The Stewart Motel would be converted to employee housing. Additional support facilities for the lodge would be constructed. Site improvements and parking would emphasize pedestrian circulation throughout the site and provide more green space.

ALTERNATIVE B ACTIONS WOULD:

Area I

- Include these services:
 - Overnight visitor accommodations
 - Employee housing and support facilities
 - Maintenance support/laundry
 - Food and beverage services
 - Retail sales
 - Boat tours and rentals
 - Public restrooms and pay phones
 - Public shuttle and tours
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Construct new guest and employee parking.
- Remove the Johnson, Jammer, Hydro, and Boys' I and II Dormitories.
- Convert the Snyder and Cobb House Dormitories to guest accommodations.
- Convert the indoor employee recreation space to visitor or management use compatible with the auditorium.
- Modify boulevard and convert the majority of Lake McDonald Lodge site to pedestrian use.

Area II

- Continue existing services:
 - Overnight visitor accommodations
 - Employee housing and support facilities
 - Food and beverage services
 - Retail sales
 - Horseback riding
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Remove existing parking area for the Coffee Shop to create a pedestrian green space.
- Remove Post Office and expand visitor parking near the General Store.
- Construct new guest and employee parking.
- Modify the Coffee Shop to architecturally blend with area theme. Add employee dining and post office to this structure.
- Remove Girls' Dormitories 1 and 2 and restore sites to open space.
- Convert the Stewart Motel from guest accommodations to management-level employee housing.
- Construct new employee housing behind the existing Coffee Shop and construct outdoor recreation space.
- Construct new public restroom.
- Convert Garden Court Dormitory to guest accommodations.
- Remove parking and driveway by cabins and convert to a pedestrian-only zone.
- Construct a new laundry and maintenance facility to serve the hotel.

Alternative C (Preferred) would make changes similar to those in alternative B, with a slight increase in the number of overnight accommodations. This alternative would better consolidate employee housing, which would be removed from the flood-prone areas. It would emphasize pedestrian circulation and improve the visitor's experience by providing a central parking area to better orient guests to the area. The Coffee Shop would be replaced with a new restaurant, and the Stewart Motel and Annex would be replaced with a new motel.

ALTERNATIVE C ACTIONS WOULD:

Area I

- Include these services:
 - Overnight visitor accommodations
 - Employee housing and support facilities
 - Maintenance support/laundry
 - Food and beverage services
 - Retail sales
 - Boat tours and rentals
 - Public restrooms and pay phones
 - Public shuttle and tours
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Modify the main entrance road and reconfigure parking on boulevard.
- Construct new guest and employee parking.
- Remove the Johnson, Jammer, Hydro, and Boys' I and II Dormitories.
- Convert the Snyder and Cobb House Dormitories to guest accommodations.
- Convert the indoor employee recreation space to visitor or management use compatible with the auditorium.
- Close west access to vehicles and convert to foot and bicycle trail.

Area II

- Continue existing services:
 - Overnight visitor accommodations
 - Employee housing and support facilities
 - Food and beverage services
 - Retail sales
 - Horseback riding
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Remove existing parking area for the Coffee Shop and create a pedestrian green space.
- Remove Post Office and expand visitor parking near the General Store.
- Construct new guest and employee parking to provide adequate space.
- Remove the Coffee Shop and construct a new restaurant with employee dining and post office.
- Remove Girls' Dormitories 1 and 2 and restore sites to open space.
- Remove the Stewart Motel and construct a new guest motel and parking on the same site.
- Construct new public restroom.
- Convert Garden Court Dormitory to guest accommodations.
- Construct new access road and formalize parking adjacent to the guest cabin units.
- Construct new employee housing and outdoor recreation area behind Coffee Shop.
- Construct a new laundry and maintenance facility to serve the hotel.

See Appendix 2 for prescriptions and standards.

See Appendix 4 for additional information on existing and proposed services and facilities.

LAKE MCDONALD**Alternative C — Preferred**

The preferred alternative C would best accomplish the goals for the area by: 1) consolidating employee housing and functions in one area and removing them from flood-prone areas; 2) replacing the historically incompatible Coffee Shop with a building more suited to the scene, and allowing more flexible use of the site to improve parking and relocate employee housing; 3) improving the range of visitor accommodations by converting existing structures to lower cost hostel and a few deluxe guest accommodations; and 4) replacing the Stewart Motel with an upgraded, modernized facility that makes better use of the site and is more economical than a costly remodel of the existing strip motel buildings. Both alternatives B and C improve the sense of arrival to the lodge by consolidating parking away from the boulevard, but alternative C offers more flexibility to address parking and circulation needs at the location.

Lake McDonald
Preferred Alternative

RISING SUN DEVELOPED AREA



Rising Sun is located near the eastern entrance to Glacier National Park along the Going-to-the-Sun Road. This road traverses the park's magnificent mountains, connecting its east and west sides. After the road was dedicated in 1933, the National Park Service wanted more economical accommodations than were offered by the park's grand hotels.

The success of the cabin-style accommodations at

Swiftcurrent spurred the Park Service to request that the Great Northern Railway build additional cabin camps. The Rising Sun Auto Camp was constructed in 1941 and is now an historic district.

Today, the entire complex contains 37 motel rooms and 35 cabins, a restaurant, general store, public showers, employee housing and other visitor support facilities. There is a public boat launch and dock, campground and a picnic area. Boat tours are offered on St. Mary Lake.

Rising Sun overlooks St. Mary Lake and contains many valuable environmental and significant cultural resources. To preserve these resources and enhance visitor use, site-sensitive alternatives were developed using the following site analysis.

Rising Sun Site Analysis

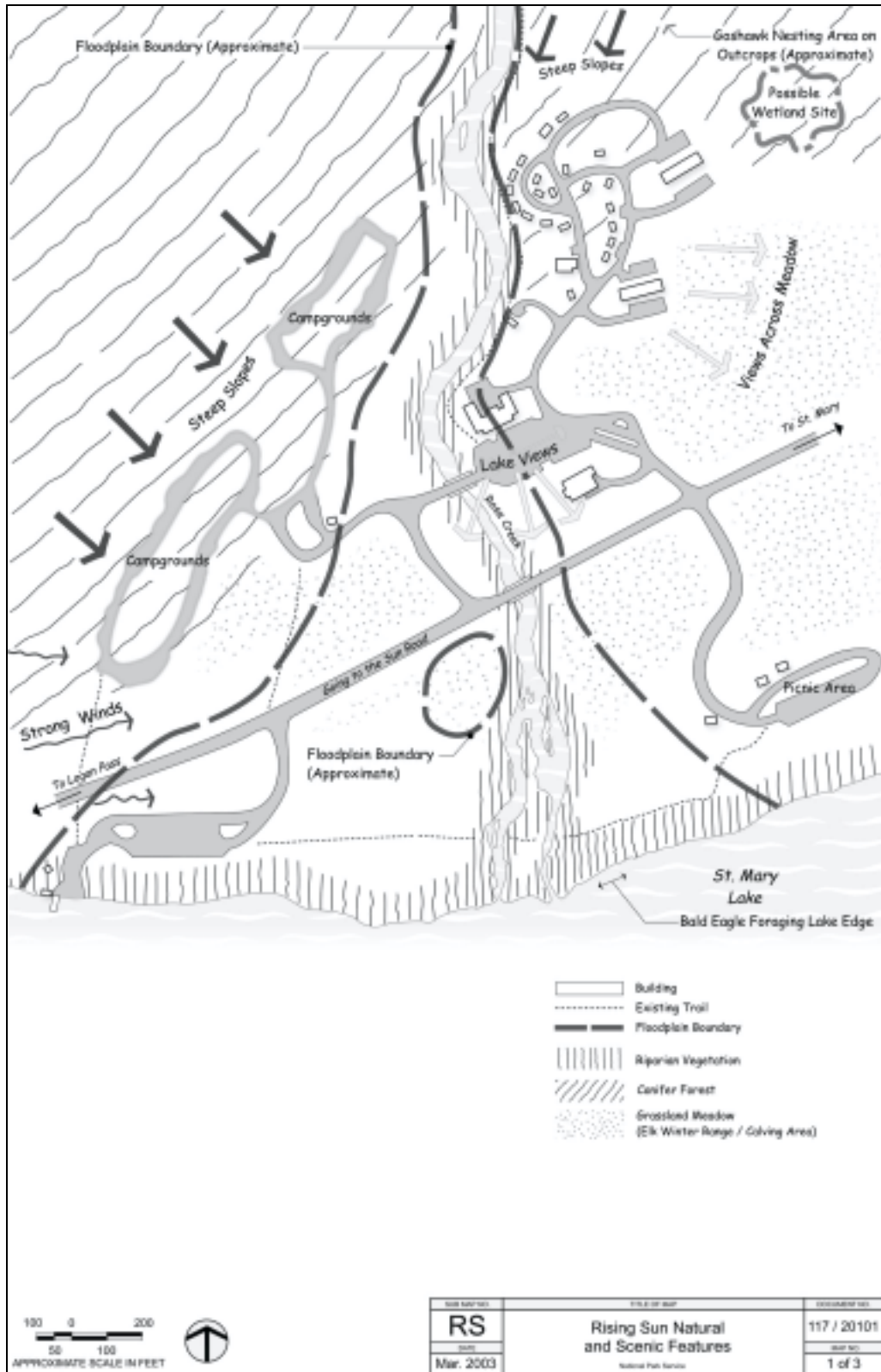
Natural and Scenic Features

- Topography and soil conditions:* The terrain slopes down from the cabin/motel area to the lake. There is a very large rock escarpment to the north immediately behind the Rising Sun developed area.

Rose Creek winds down the mountain between the campground and cabins, and past the main parking lot.

Soils at Rising Sun range from mainly gravel and loam to sandy loam, with a thin layer of topsoil. Alluvial material from boulders to gravel is found in the bed of Rose Creek.

A wetland has been identified east of the upper motel unit.
- Views:* Open meadows offer down-valley views to the east, and steep terrain offers spectacular mountain scenery to the south and west. The lake can be seen from clearings to the south. Dense vegetation near the cabins filters and inhibits views in this area.
- Weather:* Strong winds regularly blow across the continental divide from the west and down St. Mary Valley. High snow-pack and drifting snow due to high winds limit accessibility to this site during the winter months.



MAP 2-8. RISING SUN NATURAL AND SCENIC FEATURES

- *Floodplain.* The General Store/Motel, a portion of the Going-to-the-Sun Road and part of the visitor parking lot are within the 100-year floodplain. Undercutting of the bank near the cabins and behind the General Store/Motel by Rose Creek has caused slope erosion.
- *Vegetation:* Rising Sun has diverse types of vegetation ranging from open fescue grasslands to dense coniferous forests interspersed with stands of aspen and black cottonwood. The open meadows are sensitive to disturbance and susceptible to invasion by exotic weed species. Riparian vegetation grows along the shore of St. Mary Lake and Rose Creek.
- *Wildlife:* Elk and other ungulates make heavy use of the entire area during all seasons except mid-summer, and elk calving occurs in the vicinity of the developed area in early summer. Grizzly bears move through the area except in winter. Gray wolves have been sighted adjacent to the developed area. Bald eagles nest on St. Mary Lake and use the lakeshore near Rose Creek for foraging, especially in spring. The cliffs to the northwest of the developed area are a potential nesting site for peregrine falcons. Lynx and wolverine have been documented within the developed area, as have northern goshawk and golden eagles, indicating possible nesting nearby.

(See Map 2-8. Rising Sun Natural and Scenic Features.)

Cultural Features

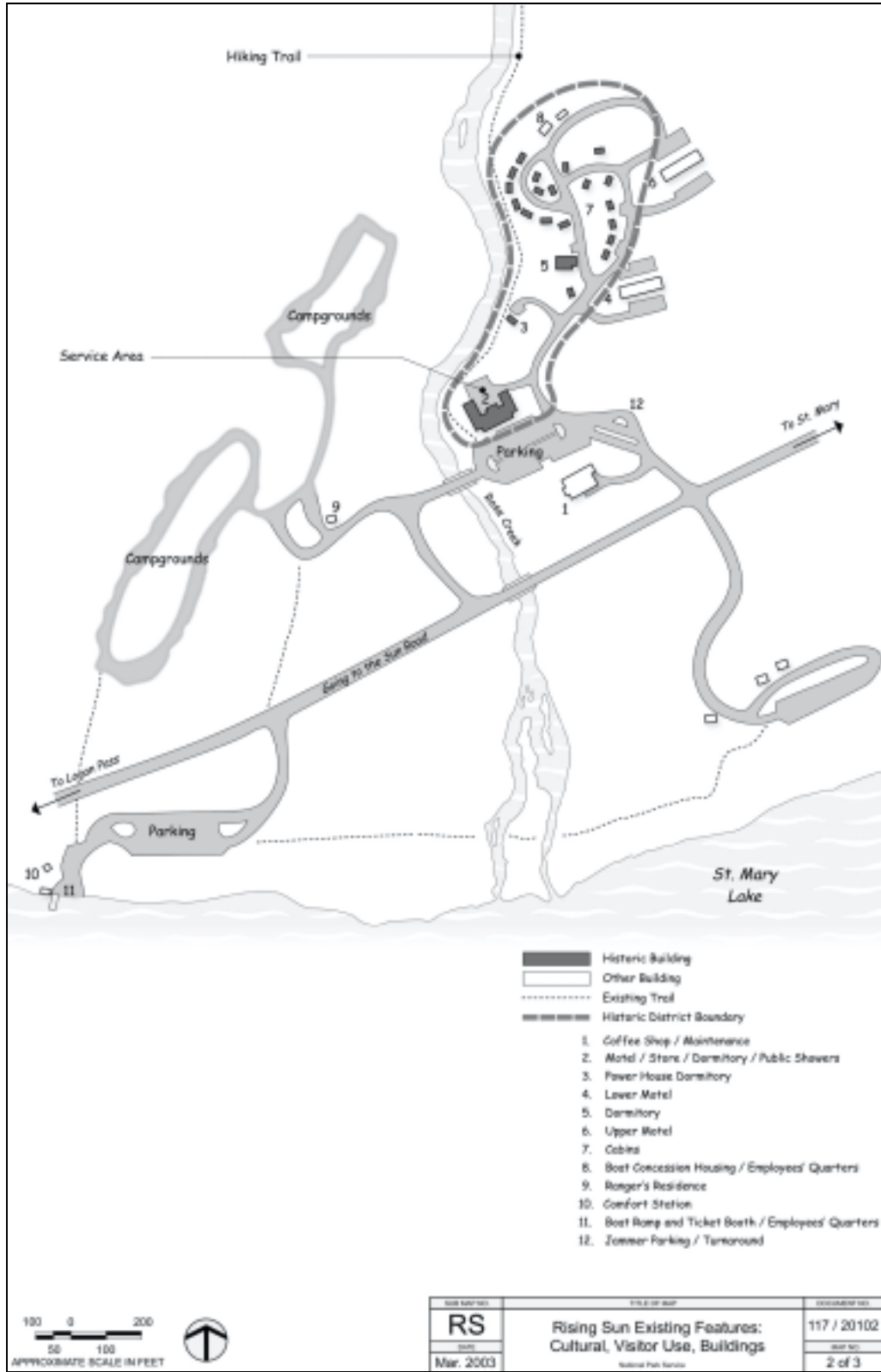
Rising Sun reflects a major shift in concessioner development, away from the scale and luxuries of Glacier National Park's large hotels, toward more spartan and economical facilities. The camp began as a group of buildings – Coffee Shop/Campstore (now the General Store/Motel), dormitories and 19 cabins – designed by the Great Northern Railway's architectural offices in St. Paul for use by motorists who wanted economical and efficient services.

The General Store/Motel, constructed in 1940, was among the first buildings in the park designed specifically for motoring tourists. It was strategically placed near Going-to-the-Sun Road in a central location, easily accessible by both campground and cabin patrons. The building, which included a large central lobby, housed several activities under a single roof, which was uncommon at the time.

The buildings at Rising Sun were patterned after the Swiss design that had become the Glacier Park Hotel Company's trademark. The modest cabins were placed in irregular patterns along natural topographic lines, in an isolated area that did not intrude on the landscape.

The significant cultural features are:

- *Landscape*
 - Remains of former gardens at cabins
- *Buildings* (all within the National Register Historic District)
 - General Store/Motel
 - Dormitory
 - Power House Dormitory
 - Cabins



**MAP 2-9. RISING SUN EXISTING FEATURES:
CULTURAL, VISITOR USE, BUILDINGS**

Visitor Use

- ***Activities:*** Hiking and boating are the two primary activities at Rising Sun. A main hiking trail originates at the large parking lot and continues up Rose Creek to a lake about six miles upstream. There are numerous trailheads near the area leading to remote destinations including Gunsight Pass, Jackson Glacier, Piegan Pass and various waterfall sites in the valley.

This area provides facilities for the terminus of road-based tours, picnicking, camping and boat tours.

There are opportunities for wildlife viewing.

Visitor accommodations include cabins, a motel and camping.

Dining facilities are provided by the Coffee Shop.

Retail sales and public showers are provided at the General Store/Motel. There is a small gift shop by the Coffee Shop.

Circulation, Buildings and Utilities

- ***Buildings:*** Rising Sun has a rustic, auto camp character. Public activity buildings are located in the more open, downhill portion of the site, while the lodging and staff areas tend to be uphill.

The General Store/Motel has been renovated and serves as a motel, store and dormitory. There are very limited visitor showers behind the store. There is a small restaurant to the south of the large parking lot. The service area for this restaurant and the maintenance shop are in the basement, as are staff food service and some staff housing.

There are two small motel units with good views of the valley and several small, rustic guest cabins in the trees with limited views.

The concessioner housing is located in the center of the development, causing conflicts between staff and visitor activities. Indoor and outdoor recreational space is limited and located in public use areas.

The boat dock area has a small concessioner's ticket booth, which includes housing for one employee, a boat ramp and parking. This ticket booth is frequently surrounded by high water in the spring. The employee in residence relies on the public restroom facility next door to the ticket office.

In 2000, an assessment was conducted of the condition and code compliance of concessioner-operated buildings at Rising Sun. It was found that there were diverse condition and code issues in the varied mixture of individual cabins, motels, dorms and larger Coffee Shop and General Store/Motel buildings. Accessibility improvements are needed for lodging unit bathrooms and in locations where pathway areas are damaged or improper. Needed improvements to cabins and motels include installing GFI electrical outlets; safer distribution wiring; upgraded fire alarm systems; and the replacement of worn plumbing fixtures and damaged roof areas.

Needed improvements to the General Store/Motel and the Coffee Shop would be exterior surface renovations, structural improvements, additional fire alarm work, and electrical, mechanical and plumbing system upgrades.

- ***Circulation:*** The main entrance points for vehicles are from the Going-to-the-Sun Road. A mixture of visitor parking and tour bus accommodations near the entrance creates a congested convergence of vehicles and pedestrians. Other small roads from the Going-to-the-Sun Road provide access to the lake, day use picnic areas and the large Rising Sun campground.

Roads in the cabin area are in varying states of deterioration, with a high level of surface deterioration and edge erosion. Pedestrian circulation through the site is poorly defined, resulting in many informally created routes. Pedestrian conflicts with vehicles occur throughout the site.

(See Map 2-9. Rising Sun Existing Features: Cultural, Visitor Use, Buildings.)

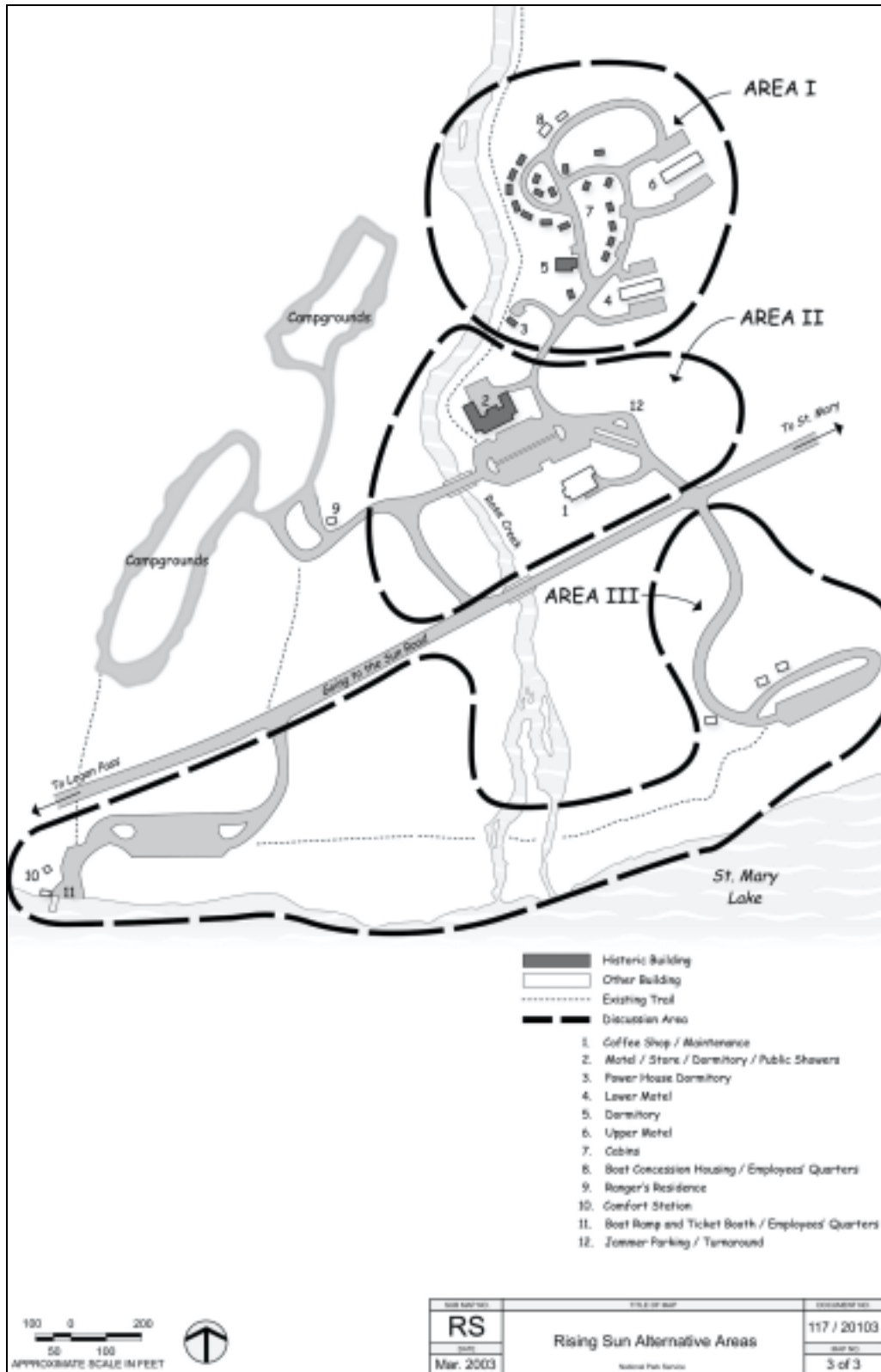
Rising Sun Site Alternatives

The goal is to provide a full range of visitor services at Rising Sun as stated in the General Management Plan and to preserve the historic values (such as the historic auto camp).

The overall objectives for the Rising Sun developed area are to:

1. Comply with life safety, accessibility and building codes.
2. Reinforce and maintain the historic auto camp character.
3. Promote pedestrian use of the area and improve pedestrian circulation.
4. Enhance visitor experience by improving:
 - Existing visitor services,
 - Orientation, information and interpretive opportunities,
 - Separation of guest and employee functions.
5. Improve employee housing and recreation.
6. Protect historic structures from flood and erosion.
7. Relocate guests and employee overnight use out of the 100-year floodplain.

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MAP 2-10. RISING SUN ALTERNATIVE AREAS

Alternative A (status quo/no action) would retain all existing services and facilities, but address life safety, accessibility and building code deficiencies. Standard overnight accommodations would continue to be provided in motel and two-unit cabins. Most employee housing would continue to be provided on site. Improvements would provide another 25+ years of useful life. This alternative is also a component of alternatives B and C.

ALTERNATIVE A ACTIONS WOULD:

Area I

- Continue existing services:
 - Overnight visitor accommodations (cabins and motel)
 - Employee housing and related facilities
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Stabilize the bluff above Rose Creek.

Area II

- Continue existing services:
 - Overnight visitor accommodations
 - Employee housing and related facilities
 - Food and beverage services
 - Retail sales
 - Public showers, restrooms and pay phones
 - Public shuttle and tours
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Reinforce and raise the existing berm behind the General Store/Motel building.

Area III

- Continue existing services:
 - Picnic area
 - Public boat launch and dock
 - Boat tours
 - Employee housing
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.

Alternative B would continue current services with some adaptation of buildings and new construction to address life safety issues. The current character of the historic auto camp would be retained. Employee housing and guest accommodations would be removed from flood-prone areas and consolidated, allowing for the adapted use of the General Store/Motel building with expanded public showers and other support services. Consolidating employee housing and recreation facilities near the Lower Motel would provide better separation of guest and employee activities. New cabins would be provided to replace the accommodations removed from the General Store/Motel building. The boat ticket office would be relocated outside of the lake's high water zone.

ALTERNATIVE B ACTIONS WOULD:

Area I

- Include these services:
 - Overnight visitor accommodations (cabins and motel)
 - Employee housing and related facilities
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Stabilize the bluff above Rose Creek supporting the historic guest cabins.
- Construct approximately five two-unit cabins and associated parking on the upper loop.
- Convert approximately three employee cabins to guest lodging.
- Construct a new employee dormitory and associated parking near the Lower Motel.
- Construct an employee indoor recreation facility in the new employee dormitory and an outdoor recreation facility in the same general area.

Area II

- Include these services:
 - Employee support facilities
 - Food and beverage services
 - Retail sales
 - Public showers, restrooms and pay phones
 - Public shuttle and tours
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Remove guest and employee housing from General Store/Motel and Coffee Shop buildings.
- Renovate the General Store/Motel building for public showers/restrooms, public laundry, guest registration and retail.
- Reinforce and raise the existing berm behind the General Store/Motel building.

Area III

- Include these services:
 - Public boat launch and dock
 - Boat tours
 - Picnic area
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Relocate boat ticket office out of high water zone and relocate boat concessioner employee housing to Area I.

Alternative C (Preferred) would continue the current services and include many of the adaptations proposed in alternative B. Further separation of guest and employee activities would be provided by adaptive use of existing dormitory facilities, and new construction of replacement housing and guest accommodations outside the floodplain near the motel. The restaurant capacity and types of overnight accommodations could be expanded to include a few high standard accommodations with the majority remaining at the standard level. Boat concessioner housing would be relocated near the Lower Motel.

ALTERNATIVE C ACTIONS WOULD:

Area I

- Include these services:
 - Overnight visitor accommodations (cabins and motel)
 - Employee housing and related facilities
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Stabilize the bluff above Rose Creek supporting the historic guest cabins.
- Construct approximately ten two-unit cabins and associated parking on the upper loop.
- Convert approximately three employee cabins to guest lodging.
- Construct two new employee dormitories and associated parking near the Lower Motel that was converted to employee housing.
- Construct an employee indoor recreation facility in the new employee dormitory and an outdoor recreation facility in the same general area.
- Convert Lower Motel to employee housing.
- Convert the main Dormitory to guest lodging.
- Relocate Boat Concessioner Housing to new dormitories. Remove existing Boat Concessioner Housing.
- Convert Power House Dormitory to storage.

Area II

- Include these services:
 - Employee support facilities
 - Food and beverage services
 - Retail sales
 - Public showers, restrooms and pay phones
 - Public shuttle and tours
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Remove guest and employee housing from General Store/Motel building.
- Renovate the General Store/Motel building for public showers/restrooms, public laundry, guest registration and retail.
- Reinforce and raise the existing earth berm behind the General Store/Motel building.
- Modify intersection to campground.
- Increase restaurant capacity with an addition to the existing restaurant.

Area III

- Include these services:
 - Public boat launch and dock
 - Boat tours
 - Picnic area
- Upgrade picnic facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new accessible trails and walks.
- Replace the boat tour ticketing office out of the high-water zone and relocate employee housing to new dorm site in Area I.

See Appendix 2 for prescriptions and standards.

See Appendix 4 for additional information on existing and proposed services and facilities.

RISING SUN

Alternative C — Preferred

The preferred alternative C would provide the best separation of employee and guest functions and create the most flexibility for accommodating a variety of employee housing and recreational needs at the site. It would improve safety by removing both guest and employee overnight accommodations from the floodplain. It also provides additional cabin-type accommodations that would enhance the auto camp character. Restaurant capacity would be increased to better serve guests.

Rising Sun
Preferred Alternative

TWO MEDICINE DEVELOPED AREA



Two Medicine was developed by the Great Northern Railway in 1914. At that time, the railway wanted to increase passenger fares by drawing affluent tourists to the area known as the “American Alps.” Visitors arrived at the park by train and then traveled from one scenic location to another on horseback, staying overnight at quaint chalets in mountain settings.

Two Medicine was one of the first stops on these early chalet tours. The original complex included a number of chalet-style cabins, a dormitory and dining hall. The dining hall building, which has been visited by two U.S. presidents, is in the National Register of Historic Places and is a national historic landmark. It is all that remains today of the chalet complex and is currently operated as a general store.

Two Medicine possesses a number of significant cultural and environmental resources. To preserve them and enhance visitor use, site-sensitive alternatives were developed using the following site analysis.

Two Medicine Site Analysis

Natural and Scenic Features:

- *General:* Two Medicine is a small, rustic day use site with camping on the east side of Two Medicine Lake. Spectacular views and hiking are major attractions of the area. It is relatively isolated and consequently, not as heavily used as some other areas within the park.
- *Topography and soil conditions:* The mild sloping valley terrain is bordered on the west side by the lake, and on all other sides by forest and mountains.
Soil deposits from Appistoki Creek here tend to be gravelly and alluvial. Apparent flooding where the creek meets the lake has compounded the high amount of erosion in this area.
- *Views:* The primary views are across Two Medicine Lake to the mountains, including Rising Wolf Mountain to the northwest. The valley floor frames these mountain views. Most of the views elsewhere are obstructed by vegetation.
- *Weather:* Strong westerly winds blow from the lake, which receives heavy snowfall. Due to the snowfall, the area is closed to vehicular traffic during the winter months.
- *Floodplain:* Appistoki Creek divides the camping and ranger station from the public day use activity area. Vehicles and pedestrians share a single bridge across the creek. Man-made berms along the sides of the creek control flooding and erosion.



MAP 2-11. TWO MEDICINE NATURAL AND SCENIC FEATURES

- *Vegetation:* Vegetation in the Two Medicine Valley consists of mixed coniferous forest. Productive riparian and wetland areas surround the development zone and are home to several species of amphibians. The vegetation cover at the general store/restroom site is sparse and mostly deciduous, with some evergreen trees.
- *Wildlife:* The forested and riparian areas adjacent to the developed area are seasonal habitat for numerous migratory birds, Canada lynx and wolverine. These areas also form an important travel corridor for grizzly bears. The slopes of Rising Wolf and Appistoki Mountains are used seasonally by black and grizzly bears, as well as bighorn sheep and mountain goats. Pray Lake is an important area for waterfowl and its shallow areas are a crossing site for various wildlife species. The narrow valley floor contains several large lakes. There is north-south movement of many species of wildlife in summer in the limited forested areas between the lakes. Increased human presence and development in these areas could affect wildlife movement in the valley.

(See Map 2-11. Two Medicine Natural and Scenic Features.)

Cultural Features

Historically, Two Medicine accommodated visitors who toured the park's backcountry by foot, boat or horseback. The chalets were grand structures that provided luxuries after a long day of negotiating rugged country.

Three original buildings remain at Two Medicine that are of historic significance. The General Store was a dining hall designed by Samuel L. Bartlett, architect for the railway. It was constructed in 1914 and designated as a national historic landmark in 1987. The Boat House, constructed in 1926, is in the national register and the Boat Concession Housing structure may be part of an original chalet.

The General Store is the only surviving building from the Two Medicine complex of chalets. It is an excellent example of the Swiss Alpine style that was the hallmark of the Great Northern Railway's architecture.

The significant cultural features are:

- *Landscape*
 - Panoramic views
 - Stone bridge over Appistoki Creek
- *Buildings*
 - General Store
 - Boat House

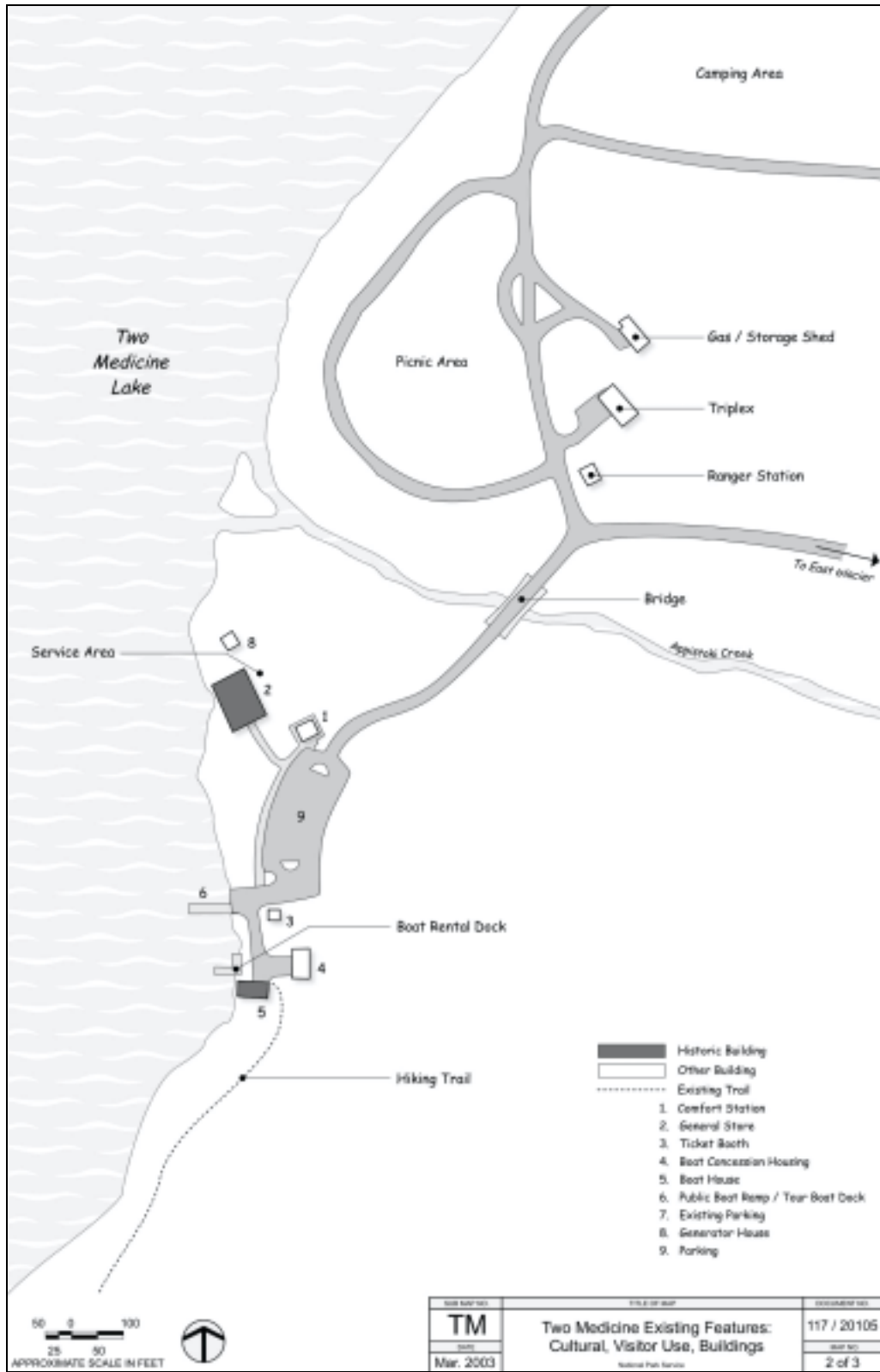
Visitor Use

- *Activities* include camping, boating, hiking, backpacking and wildlife viewing. A concessioner offers boat rides and rentals.

Retail and food items are offered at the General Store.

Circulation, Buildings and Utilities

- *General:* Two Medicine is a small, rustic, day use site with an adjacent campground on the east side of Two Medicine Lake. The area is relatively isolated and consequently not as heavily used as other visitor sites within the park.



**MAP 2-12. TWO MEDICINE EXISTING FEATURES:
CULTURAL, VISITOR USE, BUILDINGS**

- *Buildings:* Existing structures include the General Store, Comfort Station, Ranger Station, Boat House and Boat Concession Housing. The General Store and Boat House are historic structures. Most structures at this site need repair and restoration, particularly the historic Boat House and residence. The Comfort Station intrudes on the historic scene.

The Two Medicine concessioner's area is comprised of the General Store, Boat House and Boat Concession Housing. In 2000, an assessment was conducted of their condition and code compliance. It was found that their condition varies from good to very poor. Required improvements for the General Store would need to include some resurfacing of the exterior walls and frames, structural stabilization, porch area improvements, secondary electrical system upgrades, and renovation of the kitchen, laundry and sleeping rooms. The skylight glazing, railings and roof would need replacement.

The Boat Concession Housing and Boat House are in poorer condition. Staff housing needs a new foundation, leveling and resurfacing of the flooring structure, straightening and refinishing of the walls, and refurbishing of the exterior surfaces.

Electrical and plumbing upgrades to the house are required. The Boat House needs reconstruction onto a foundation; replacement of the rotting framing, siding and floor systems; the reinstallation of the rails, windows and structural stabilization elements. The roofing on both structures needs to be replaced. After the two structures were relocated, proper grading and drainage improvements are needed to prevent further deterioration of the wood structures.

- *Circulation:* From the road, one primary drive connects both the day use and camping areas. A parking lot is adjacent to the primary drive and General Store; and a small drive connects to the Boat House and dock. There are no separate parking areas for buses or RVs. There is no designated service delivery area for the General Store.

Visitors walk from the parking lot, past a Comfort Station, to the General Store. There is a large amount of foot travel from the parking lot to the lakeshore. High surface erosion occurs because pedestrian trails are not formalized and there are only undesignated, social pathways.

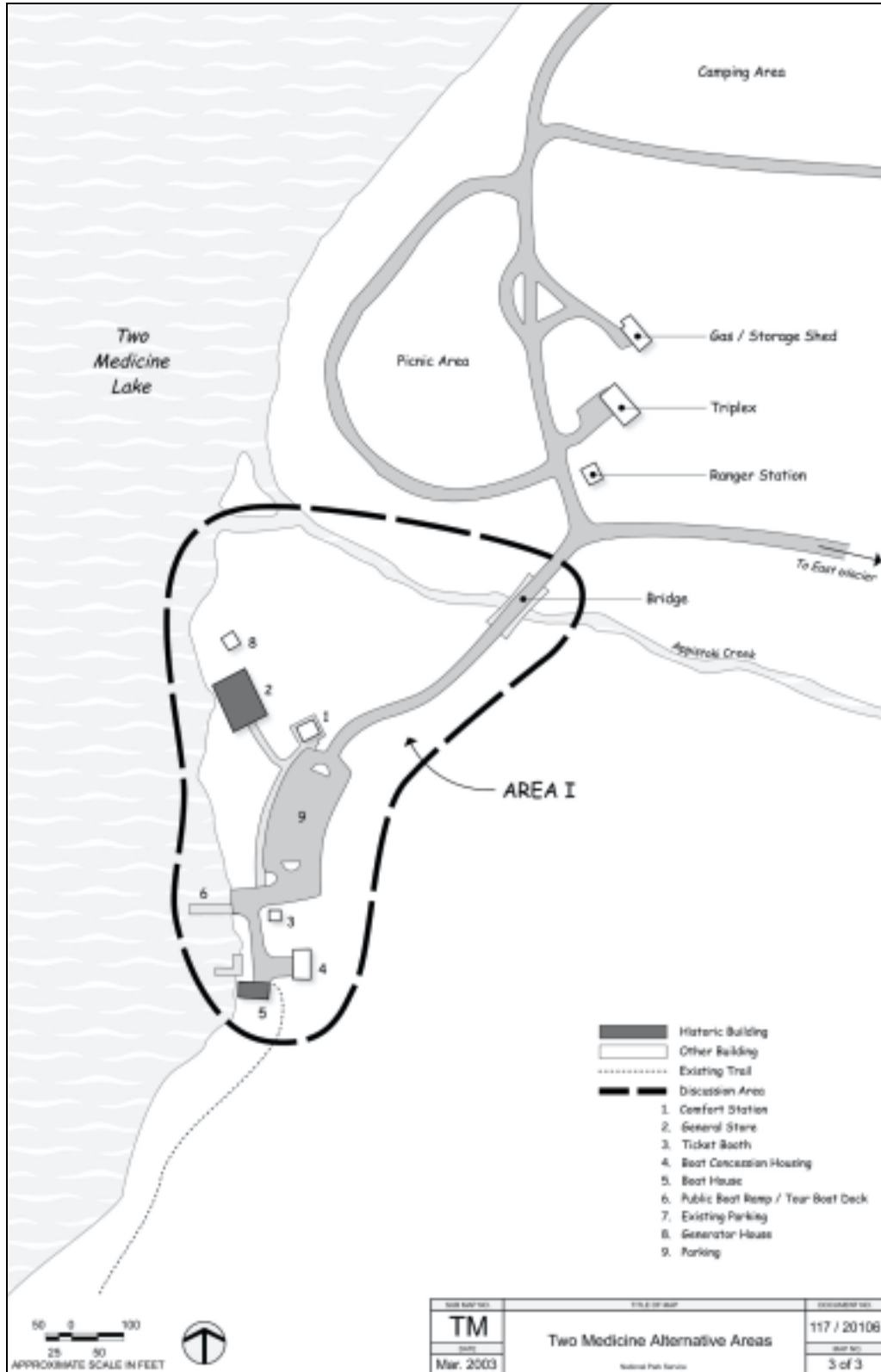
(See Map 2-12. Two Medicine Existing Features: Cultural, Visitor Use, Buildings.)

Two Medicine Site Alternatives

The goal is to preserve the culturally significant resources and provide traditional recreational and visitor services. In accordance with the General Management Plan, the developed area would remain small and would not provide all services.

The overall objectives for the Two Medicine developed area are to:

1. Comply with life safety, accessibility and building codes.
2. Reinforce and maintain the historic and architectural character, and the cultural landscape.
3. Promote pedestrian use of area.
4. Enhance visitor experiences by improving:
 - Existing visitor services,
 - Scenic views and experiences along the shoreline,
 - Orientation, information, and interpretive opportunities,
 - Sense of arrival.



MAP 2-13. TWO MEDICINE ALTERNATIVE AREAS

Alternative A (status quo/no action) would retain all existing services, address life safety, accessibility and building code deficiencies. Improvements would provide another 25+ years of useful life and the existing comfort station would be modified to be more compatible with the other historic buildings at Two Medicine.

ALTERNATIVE A ACTIONS WOULD:

Area I

- Continue existing services:
 - Limited employee housing
 - Food and beverage services
 - Retail sales
 - Boat tours and rentals
 - Public shuttle and tours
- Upgrade ticket booth for accessibility.
- Modify the Comfort Station for historic compatibility.
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Maintain the present channel of Appistoki Creek to protect the developed area from flooding.

Alternative B (Preferred) would continue to provide a traditional rustic experience for visitors at Two Medicine. In addition to actions described in alternative A, parking would be removed from the Two Medicine Lake viewshed. The historic character of the General Store's exterior and the historic landscape would be restored. A defined service parking area and service drive would be added to the General Store area. The existing comfort station would be removed and a new one would be designed to be compatible with the area's historic architecture. It would not be in the direct view of arriving visitors, thus greatly enhancing the arrival experience. An accessible trail would be constructed between the General Store area and the campground.

ALTERNATIVE B ACTIONS WOULD:

Area I

- Include these services:
 - Limited employee housing
 - Food and beverage services
 - Retail sales
 - Boat tours and rentals
 - Public shuttle and tours
- Upgrade ticket booth for accessibility.
- Remove some parking to improve the viewshed of Two Medicine Lake.
- Remove the existing Comfort Station and construct a new Comfort Station compatible with the area's historic architecture and character.
- Restore the historic character of the General Store exterior and landscape.
- Construct new accessible trails and walks including a pedestrian bridge over Appistoki Creek to the campground.
- Construct a service road and service/bus parking area for the General Store.
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Maintain the present channel of Appistoki Creek to protect the developed area from flooding.

See Appendix 2 for prescriptions and standards.

See Appendix 4 for additional information on existing and proposed services and facilities.

TWO MEDICINE

Alternative B — Preferred

This preferred alternative would result in an improved historic scene and sense of arrival for visitors entering the area. The construction of a pedestrian trail and bridge to the campground would improve visitor safety and provide a more scenic approach to the lake.

**Two Medicine
Preferred Alternative**

MANY GLACIER DEVELOPED AREA



In 1914, the Great Northern Railway began construction of a hotel on the lakeshore in an architectural style that followed the park's alpine theme. This luxurious facility and a system of backcountry chalets across the park were meant to attract "well-heeled" visitors from the east coast who wanted to experience the American West while enjoying a continental style of accommodation. The hotel provided a comfortable atmosphere, numerous visitor amenities, bus and horseback tours, fine dining, and spectacular views of the Many Glacier Valley. The hotel is now a national historic landmark.

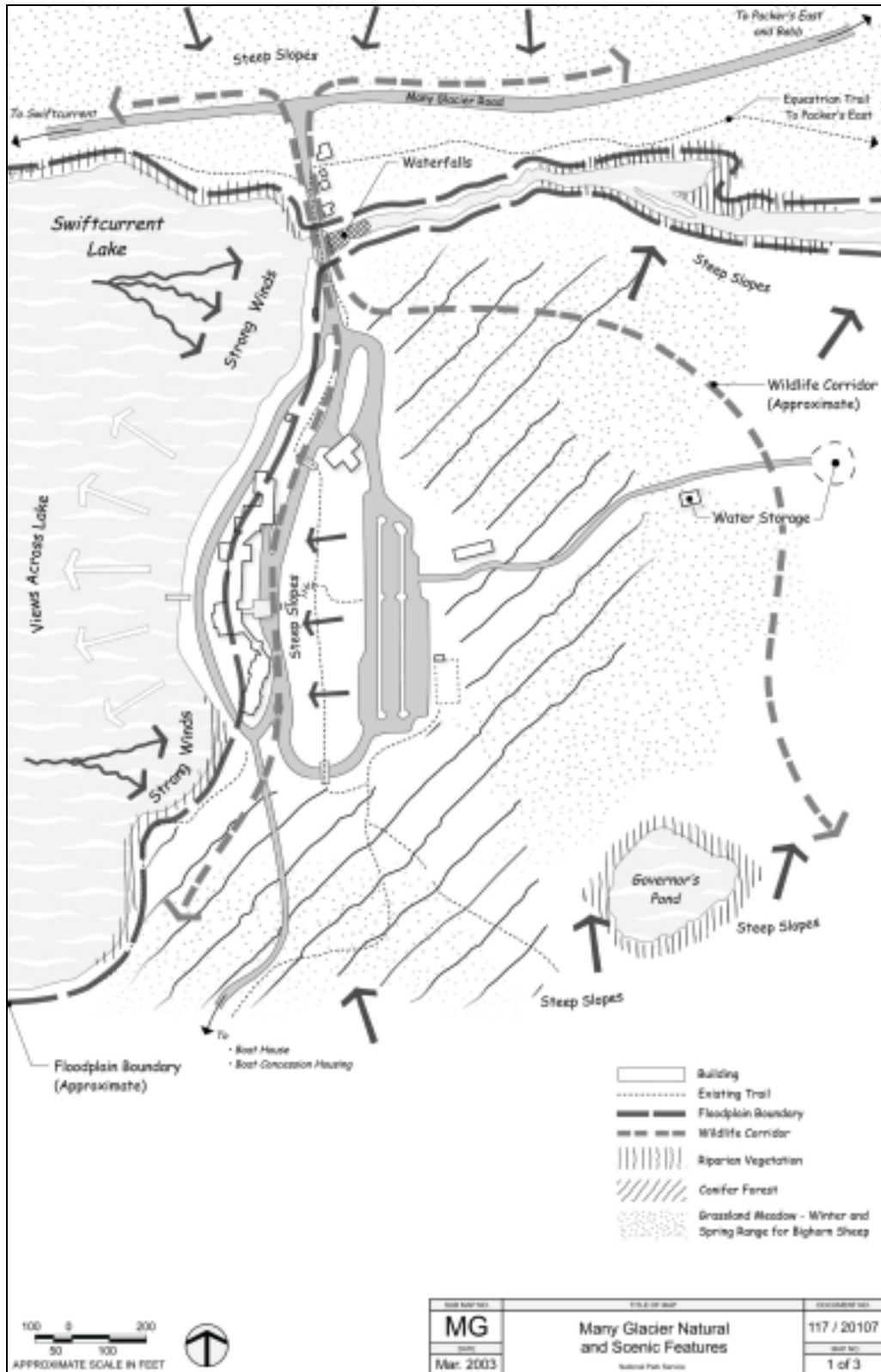
Much of the hotel complex is within an historic district. Two chalets remain from the original Many Glacier chalets and are listed in the National Register of Historic Places.

Many Glacier possesses a number of significant cultural and environmental resources. To preserve them and enhance visitor use, site-sensitive alternatives were developed using the following site analysis.

Many Glacier Site Analysis

Natural and Scenic Features

- *Topography and soil conditions:* The terrain varies widely in all directions. It ascends from the south of Swiftcurrent Lake up to Lake Josephine and a steep ridge rises from the lake on the east side of the hotel to the main visitor parking lot.
The Many Glacier Valley generally consists of alluvial soils that are mainly sand and silty loam, with glacial till underneath and a thin layer of topsoil on top. These soils are highly erodible and sensitive to disturbance.
- *Views:* The Many Glacier Valley has some of the most impressive views in Glacier National Park that are easily accessible by vehicles. Views to the west across Swiftcurrent Lake towards Mount Gould and Grinnell Glacier are some of most spectacular in the park.
- *Weather:* The area has periods of harsh weather. Winds coming from the mountains across the lake have historically reached over 100 miles per hour and frequently gust to at least half that speed. Snowfall amounts are extreme and result in early winter closure of the area.
- *Floodplain:* Many Glacier Hotel lies within the 100-year floodplain of Swiftcurrent Lake.



MAP 2-14. MANY GLACIER NATURAL AND SCENIC FEATURES

- *Vegetation:* A mosaic of grasslands interspersed with dense coniferous forest, deciduous forest and wetland areas dominates the Many Glacier Valley. A Montana Natural Heritage Program species of special concern, pink corydalis, has been reported in the developed area.
- *Wildlife:* Generally, almost all of the low-elevation sites at Many Glacier are considered travel corridors for wildlife due to the juxtaposition of the three valleys that converge near the developed sites. The open grassland slopes of Mt. Altny are sheep-lambing areas, and important fall, winter and spring range for bighorn sheep and mountain goats. Grizzly bears use all portions of the Many Glacier Valley during spring, summer and fall, and probably den in the upper elevations (interaction between visitors and bears is a management concern). Endangered gray wolves use the area during the spring and fall, and lynx and wolverine have been documented in and around the developed area. Bald eagles use Lake Sherburne during spring, summer and fall.

The narrow valley floor contains several large lakes. In summer, many species of wildlife move in the limited forested areas between these lakes.

(See Map 2-14. Many Glacier Natural and Scenic Features.)

Cultural Features

The Many Glacier Historic District, including the Many Glacier Hotel and associated outbuildings, is significant for its historical and architectural representation of the development and use of Glacier National Park from the early 1900s through the 1930s.

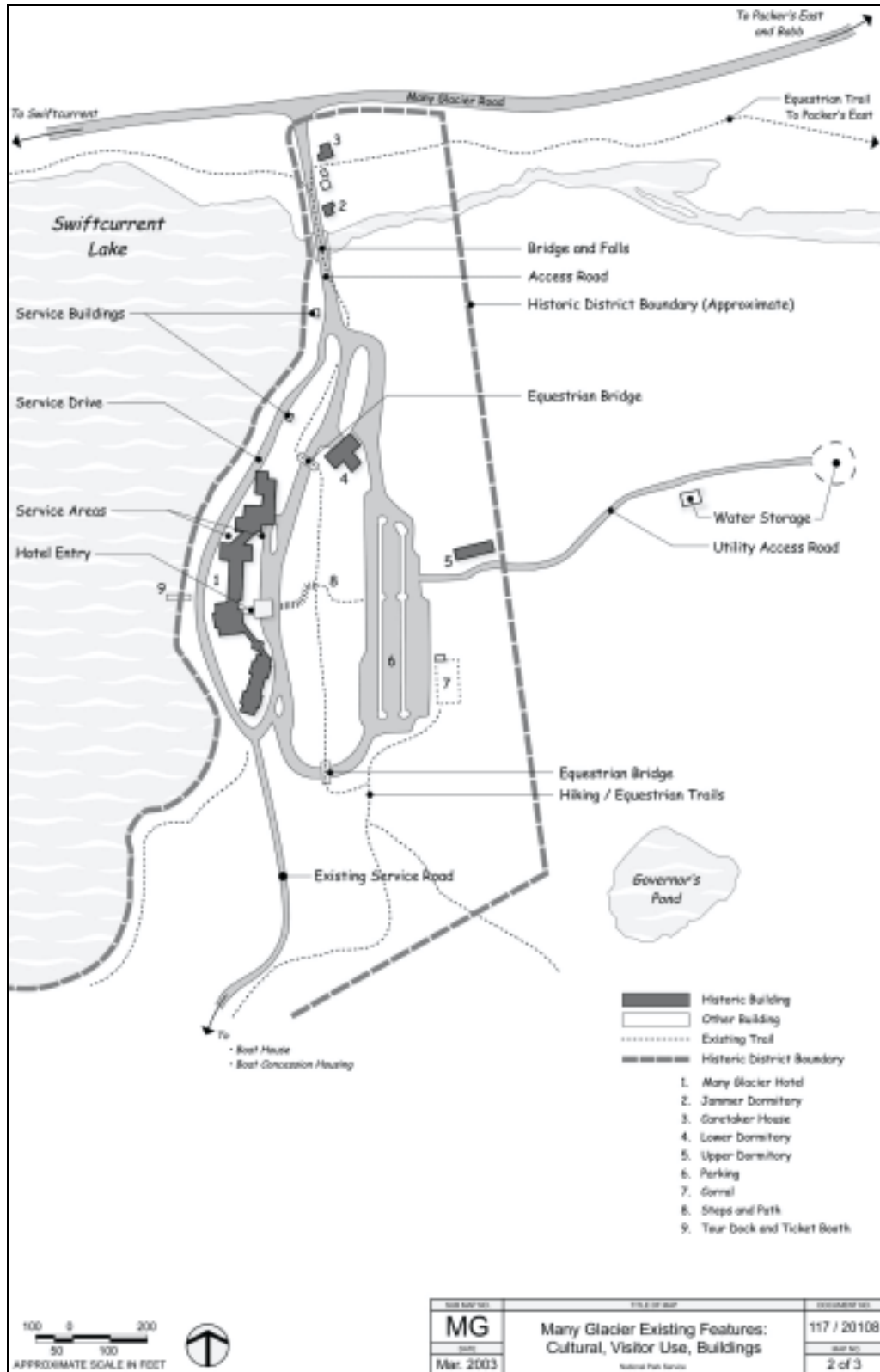
The hotel was designed by architect Thomas McMahon of St. Paul, Minnesota. It was built almost exclusively from local materials. The dramatic lakeshore setting of the hotel was meant to enhance its grand style with beautiful surroundings. This environment, in combination with the luxury-oriented hotel, makes up the unique historical heritage of the Many Glacier Hotel and Historic District.

Within this district, only two chalets remain today: the Caretaker's House and Jammer Dormitory, built in 1913.

Historically, transportation through the interior of the park was either on foot, or by horseback or boat. Remaining representations of these modes of sightseeing are the horse barn and Boat Concessioner Housing, as well as the bridle path and equestrian bridges.

The significant cultural features are:

- *Landscape*
 - Panoramic view across Swiftcurrent Lake
 - Entry sequence to the hotel
 - Bridle path equestrian bridges
 - Swiftcurrent Lake Trail
- *Buildings*
 - Many Glacier Hotel
 - Icehouse
 - Lower Dormitory
 - Upper Dormitory
 - Caretaker's House
 - Jammer Dormitory
 - Boat Concessioner Housing



**MAP 2-15. MANY GLACIER EXISTING FEATURES:
CULTURAL, VISITOR USE, BUILDINGS**

Visitor Use

- ***Activities:*** The Many Glacier Valley is one of the most popular day hiking areas in the park, and hiking and wildlife viewing are major activities. There is a nature trail along the lake just south of the hotel, and a major southward trail connection from the parking lot that leads to Cracker Lake, Lake Josephine and Grinnell Glacier.

There are number of lakeside activities, including boating, fishing, walking, photography, picnicking, or lounging to enjoy the incredible scenery. A small dock immediately west of the hotel accommodates boat tours and rentals.

One of the more popular backcountry activities is horseback riding. Horses for visitor rides are brought from the Packer's East stable site to a corral near the main parking lot, above and east of the hotel.

Large groups gather for interpretive talks in the lecture room of the hotel. The adjacent cabaret area in the hotel offers evening entertainment for visitors.

Dining facilities include a restaurant and snack bar.

A gift shop in the hotel offers retail sales.

Circulation, Buildings and Utilities

- ***Buildings:*** The Many Glacier Hotel is a national historic landmark within a national register historic district. The hotel's 900-foot length is the culmination of several additions over the years. An open, heavy timber atrium is the interior focus, serving many different lobby functions. Other support structures are in the National Register of Historic Places.

In 2000, an assessment was conducted of the condition and code compliance of most Many Glacier buildings. The hotel overall was found to be in a deteriorated condition with significant code problems. Even after two emergency stabilization projects, there are still code issues with the hotel's plumbing and electrical systems, as well as structural problems with balconies, Annex 1, the lobby building and Annex 2.

Most exterior surfacing is in poor condition with failing wood shingle roofing, bats in the walls, severe wind infiltration and failing balcony areas. Windows, wood siding and trim elements are severely weathered and damaged.

The condition of interior surfaces is only fair. Guest rooms have been refurbished in response to water damage or bat infestation, using several schemes that are generally unsympathetic to the historic character-defining features of the hotel. The support spaces vary between poor (almost untouched since renovation in the 1950s) to good condition where visibility is high.

The other buildings in the Many Glacier area have similarly poor electrical systems and some structural issues. There are violations of life safety code for fire egress and accessibility. Exteriors are weathered with damaged roofing, siding and window/door frames; there are bad crawl space enclosures and exterior stair problems. Many interiors have had basic refurbishment and life safety upgrades.

After substantial improvements to the hotel are completed in 2003, improvements would still be required for current code compliance. In addition, major renovation work on support and employee dormitory buildings would be necessary to achieve an appropriate level of resource protection and life safety compliance.

Circulation: From the Many Glacier Road, visitors enter the site by a small access road, arriving at the main entrance to the hotel. A visitor drop-off area is at the hotel entrance. A parking lot for visitor vehicles, RVs and buses is on the hill above and east of the hotel. Pedestrians arrive at the hotel below via a series of very steep steps and primitive trails, or by way of the road around the ridge.

A service road between the hotel and the lake creates conflicts between vehicles and pedestrians, and is visually unattractive. There is also an unpaved administrative road to the old Icehouse and the Boat House through the woods to the south. A separate access road from the main highway leads to the Packer's East stable site and wastewater treatment facilities.

(See Map 2-15. Many Glacier Existing Features: Cultural, Visitor Use, Buildings.)

Many Glacier Site Alternatives

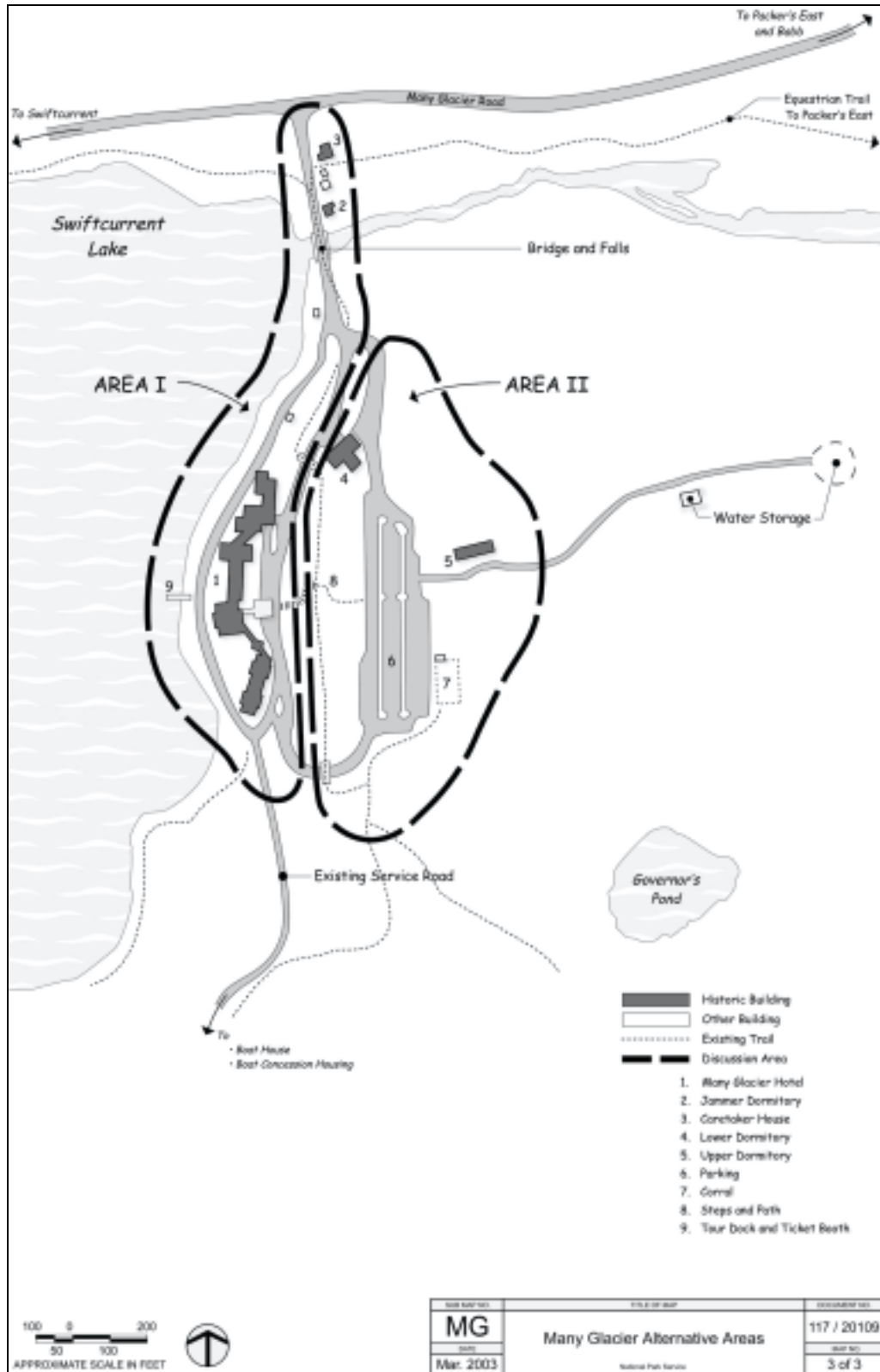
The goal is to maintain Many Glacier as a separate developed area from Swiftcurrent and provide traditional visitor and support services for both the National Park Service and concessions operation. In accordance with the General Management Plan, the nationally significant historic resources such as the grand hotel would be preserved and continue to be used for visitor services.

(See Map 2-17. Swiftcurrent, Many Glacier Area Location Map for an extended view of the area.)

The overall objectives for the Many Glacier developed area are to:

1. Comply with life safety, accessibility and building codes and standards.
2. Reinforce and maintain the historic and architectural character, and the cultural landscape.
3. Promote pedestrian use of area, and improve pedestrian circulation.
4. Enhance visitor experiences by improving:
 - Visitor services,
 - Historic setting and atmosphere,
 - Scenic views and vistas,
 - Orientation, information, and interpretive opportunities,
 - Sense of arrival,
 - Separation of guest and employee functions.
5. Improve employee housing and recreation.

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MAP 2-16. MANY GLACIER ALTERNATIVE AREAS

Alternative A (status quo/no action) would retain all existing services and facilities, but address life safety, accessibility and building code deficiencies. Standard, high and deluxe overnight accommodations would continue to be provided in the hotel. Most employee housing would be provided on site. Improvements would provide another 25+ years of useful life. This alternative is also a component of alternatives B and C.

ALTERNATIVE A ACTIONS WOULD:

Area I

- Continue existing services:
 - Food and beverage services
 - Retail sales
 - Visitor conveniences (pay phone, restrooms)
 - Boat tours and rentals
 - Public shuttle and tours
 - Overnight guest accommodations
 - Employee housing and support facilities
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Upgrade existing trails and walks for accessibility.
- Upgrade boat ticket booth.
- Prepare a flood evacuation and protection plan.

Area II

- Continue existing services:
 - Employee housing and related facilities
 - Horseback riding
- Upgrade facilities and utilities to comply with life safety accessibility and building codes.
- Upgrade existing trails and walks for accessibility.

Outside of Area I and II

- Tour boats and/or docks serving Swiftcurrent Lake and Lake Josephine would be modified to improve access for the mobility-impaired public.

Alternative B would continue to provide guests with a railway-era grand resort hotel experience. All current services and types of accommodations would be retained. Historic features such as the stairwell in the lobby would be restored and retail services would be relocated. Most space used for employee housing within the hotel would be reclaimed for guest use. The approach to the hotel and the service drive along the lakeside would be landscaped to reinforce the hotel's cultural character and improve the visitor's arrival experience. Employee housing would remain in existing dormitories with improvements, and new outdoor recreation facilities would be provided. Additional employee housing would be provided at Swiftcurrent. There would be some improvements to trails and parking to enhance the visitor's arrival experience, improve accessibility and maintain historic character. Utility systems to support the facilities would be improved. .

ALTERNATIVE B ACTIONS WOULD:

Area I

- Include these services:
 - Food and beverage services
 - Retail sales
 - Visitor conveniences (pay phone, restrooms)
 - Boat tours and rentals
 - Public shuttle and tours
 - Overnight guest accommodations
 - Employee housing and support facilities
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Upgrade existing trails and walks for accessibility.
- Upgrade boat ticket booth.
- Rehabilitate approach road including screening and parking modifications.
- Relocate the existing retail services currently provided in the lobby.
- Restore historical features to the lobby, including the historic stairwell.
- Improve service road and pedestrian access to and around the hotel.
- Remove most employee housing from the hotel.
- Prepare a flood evacuation and protection plan.

Area II

- Include these services:
 - Employee housing and related facilities
 - Horseback riding
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Upgrade existing trails and walks for accessibility.
- Upgrade employee housing in Upper and Lower Dormitories.
- Construct employee outdoor recreation facilities.

Outside Areas I & II

- Improve utility infrastructure (water and wastewater).
- Construct information/orientation pull-off on Many Glacier Road.
- Upgrade for accessibility the trail around Swiftcurrent Lake, and the connecting trail between Swiftcurrent Lake and Lake Josephine.
- Construct additional employee housing at Swiftcurrent.
- Tour boats and/or docks serving Swiftcurrent Lake and Lake Josephine would be modified to improve access for the mobility-impaired public.

Alternative C (Preferred) would continue all current services and incorporate most of alternative B. Better separation of employee and guest activities would be provided by relocating employee recreational facilities from the hotel and converting the Lower Dormitory to guest accommodations. The types of available accommodations would remain similar to currently available types. Converting the dormitory would provide the potential for some additional standard, high or deluxe units. New employee housing and recreational facilities would be constructed near the Upper Dormitory, with some additional housing needs accommodated at Swiftcurrent developed area or outside the park.

ALTERNATIVE C ACTIONS WOULD:

Area I

- Include these services:
 - Food and beverage services
 - Retail sales
 - Visitor conveniences (pay phone, restrooms)
 - Boat tours and rentals
 - Public shuttle and tours
 - Overnight guest accommodations
 - Employee housing and support facilities
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Upgrade existing trails and walks for accessibility.
- Upgrade boat ticket booth.
- Rehabilitate approach road, including screening and parking modifications.
- Relocate the existing retail services currently provided in the lobby.
- Restore historical features to the lobby including the historic stairwell.
- Improve service road and pedestrian access to and around the hotel.
- Remove most employee housing from the hotel.
- Convert several rooms for interpretation of historic functions and services.
- Remove employee indoor recreation facilities from the hotel and provide them in Area II.
- Prepare a flood evacuation and protection plan.

Area II

- Include these services:
 - Overnight guest accommodations
 - Employee housing and related facilities
 - Horseback riding
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Upgrade existing trails and walks for accessibility.
- Convert Lower Dormitory to guest lodging (approximately 30 rooms) and improve associated parking.
- Upgrade existing employee housing in Upper Dormitory.
- Construct new dormitory, including indoor recreation facilities, near Upper Dormitory, to accommodate employees from Lower Dormitory and hotel.
- Construct employee outdoor recreational facilities.

Outside Areas I & II

- Improve utility infrastructure (water and wastewater).
- Construct information/orientation pull-off on Many Glacier Road.
- Upgrade for accessibility the trail around Swiftcurrent Lake, and the connecting trail between Swiftcurrent Lake and Lake Josephine.
- Construct additional employee housing at Swiftcurrent or outside the park.
- Provide shuttle service for employees.
- Tour boats and/or docks serving Swiftcurrent Lake and Lake Josephine would be modified to improve access for the mobility-impaired public.

See Appendix 2 for prescriptions and standards.

See Appendix 4 for additional information on existing and proposed services and facilities.

**MANY GLACIER
Alternative C — Preferred**

The preferred alternative is C because it would provide the best separation of guest and employee functions and create a greater range of types of guest accommodations. It would also improve the sense of arrival to the hotel and enhance the visitor experience by removing employee recreational facilities from the hotel. Alternative C restores much of the hotel lobby to its historic appearance.

**Many Glacier
Preferred Alternative**

SWIFTCURRENT DEVELOPED AREA



The Swiftcurrent development was the first area that the National Park Service designed around the automobile and the changing visitor profile. As early as the 1920s, director Stephen Mather initiated the concept of inexpensive accommodations that did not require tipping, dress codes or lavish furnishings. After the construction of Going-to-the-Sun Road brought an influx of motoring tourists, auto camps near the park began to do a brisk business. Construction was started in 1933 on the cabins and a coffee shop/campstore at Swiftcurrent.

Today, the Swiftcurrent auto camp has grown to include 62 motel units, 26 cabins without bathrooms, a restaurant, store and public

shower/laundry building. Many of these structures are within a historic district and are listed in the National Register of Historic Places.

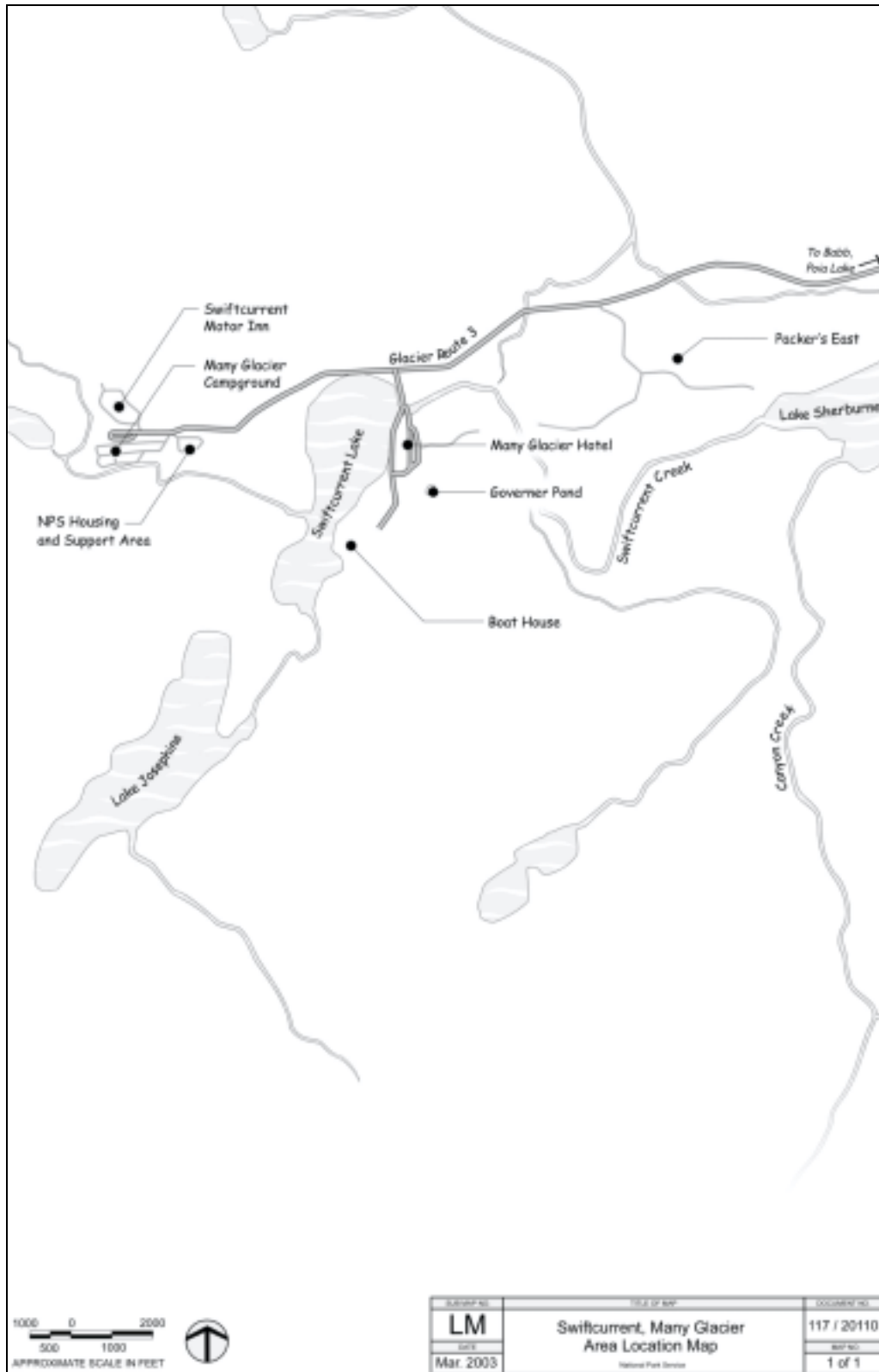
The Swiftcurrent site possesses a number of highly valuable environmental and significant cultural resources because of its unique location in the Many Glacier Valley. To preserve these resources and enhance visitor use, site-sensitive alternatives were developed using the following site analysis.

(See Map 2-17. Swiftcurrent, Many Glacier Area Location Map for an extended view of the area.)

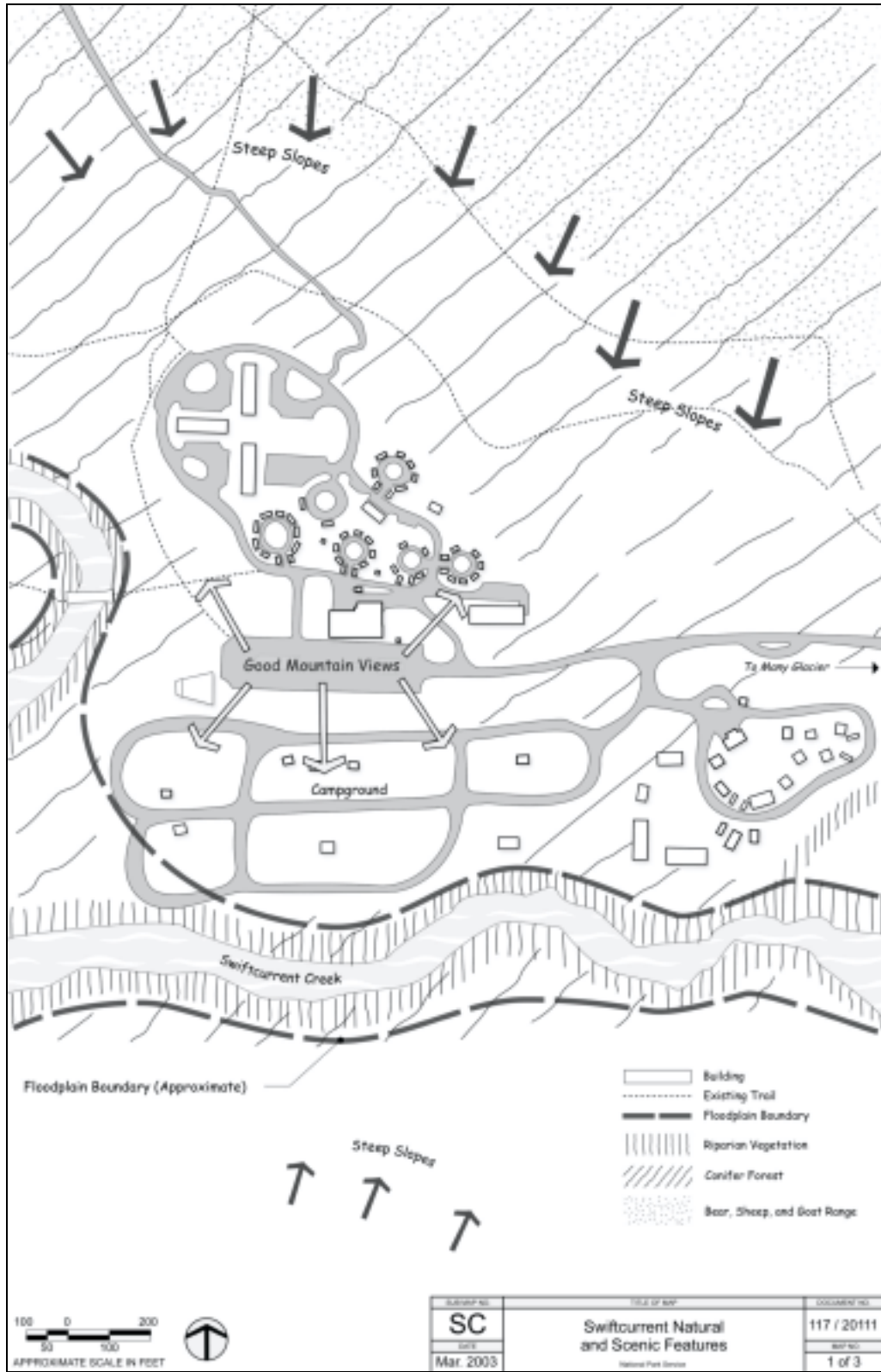
Swiftcurrent Site Analysis

Natural and Scenic Features:

- *Topography and soil conditions:* Swiftcurrent is located in the Many Glacier Valley system. The valley floor in this area is surrounded by extensive, large mountain formations, with lower level foothills in the immediate backdrop.
The soils are alluvial. They are mainly sand and silty loam, and covered with a very thin layer of topsoil. The area is highly erodible and sensitive to disturbance.
- *Views:* Most views from Swiftcurrent are limited by dense surrounding vegetation; however, the entrance road, main parking lot and picnic area offer expansive, open views of the surrounding mountains. These areas provide wildlife viewing opportunities.
- *Floodplain:* The current mapped floodplain for Swiftcurrent does not affect any of the alternatives, but the southwestern edge of the campground may be situated within the floodplain.
- *Vegetation:* The Many Glacier Valley is interspersed with dense coniferous and deciduous forest. The diversity of its vegetation provides some of the most productive wildlife habitat in the park.



MAP 2-17 SWIFTCURRENT, MANY GLACIER AREA LOCATION MAP



MAP 2-18. SWIFTCURRENT NATURAL AND SCENIC FEATURES

- *Wildlife:* Generally, almost all of the low-elevation sites in Many Glacier Valley such as Swiftcurrent are considered travel corridors for wildlife due to the juxtaposition of the three valleys that converge near the developed sites. The open grassland slopes of Mt. Altny are important fall, winter and spring range for bighorn sheep and mountain goats. Elk and moose use the area, and sheep lambing also occurs. Grizzly bears use all portions of the Many Glacier Valley during spring, summer and fall (interaction between visitors and bears is a management concern). Endangered gray wolves use the area during the spring and fall. Lynx and wolverine have been documented in and around the developed area.

(See Map 2-18. Swiftcurrent Natural and Scenic Features.)

Cultural Features

The need for no-frills accommodations influenced the design and construction by the Glacier Park Hotel Company of the first park auto camp at Swiftcurrent. The company built the Restaurant/Store in 1933 and 43 cabins in 1934-37 (many of which were destroyed in a 1936 fire). The style and placement of these buildings represents a significant break from the previous style of large hotel complexes at Glacier National Park.

The cabins are small and built in the rustic “craftsman” style, using native materials. These economical and utilitarian lodging units were arranged in five circles of approximately nine cabins each — a placement which emulates the “Indian Council Circle,” following the western Indian theme that was popular at that time. In contrast to the conspicuous placement of the large hotels within the park’s grand vistas, Swiftcurrent’s accommodations were situated in isolated areas away from the lakeshore and dramatic views, but within easy access to the backcountry trails.

Significant cultural features are:

- *Landscape*
 - Remains of former landscaping at the cabins
- *Buildings*
 - Cabin circles
 - Cabins
 - Restaurant/Store
 - Public showers
 - Buildings in the Ranger Station District that are in the National Register of Historic Places.

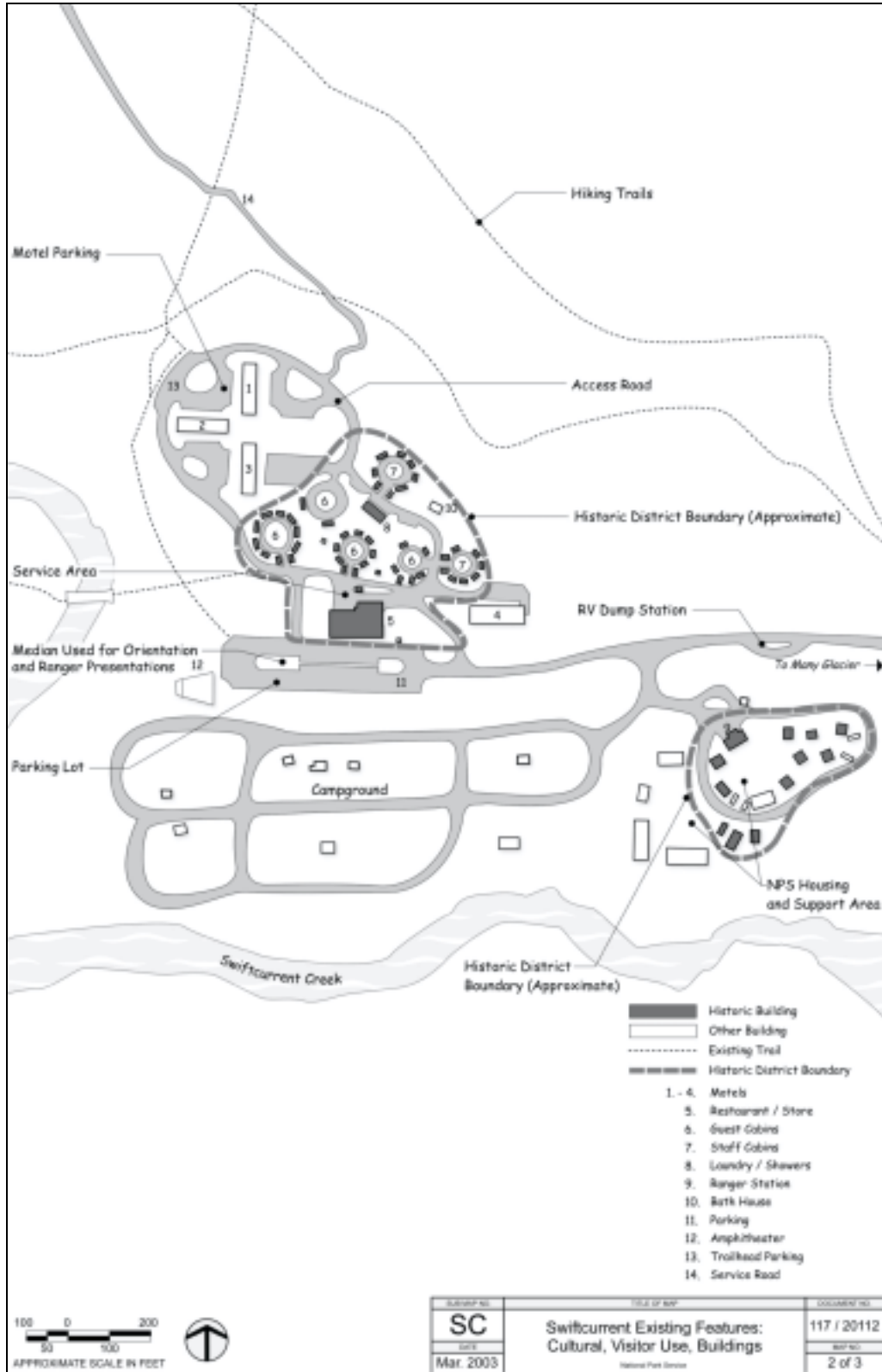
Visitor Use

- *Activities:* The Many Glacier Valley is world-renowned for its backcountry trail access. Trails from Swiftcurrent lead visitors to Lake Josephine, Grinnell Glacier and Iceberg Lake, among others. The Continental Divide Trail and several alternate routes pass through the Many Glacier area, with links to Goat Haunt at the south end of Waterton Lake and into Canada. A public boat service on Swiftcurrent Lake and Lake Josephine also augments the area’s trail system.

Large groups gather for the interpretive talks in the small amphitheater at the west end of the parking lot. Park rangers often host orientation and interpretive talks in the center of the main parking lot.

Some river-based activities including fishing, walking and photography occur in the lower south portion of the site.

There are opportunities for wildlife viewing.



MAP 2-19. SWIFTCURRENT EXISTING FEATURES: CULTURAL, VISITOR USE, BUILDINGS

Dining facilities are in the Restaurant/Store. Many visitors also take advantage of the restaurant at the nearby Many Glacier Hotel.

The store provides retail sales and the laundry/shower building serves the cabin area and nearby campground.

Circulation, Buildings and Utilities

- *Buildings:* The newly renovated Restaurant/Store is a major visitor contact for the site. It includes a lobby, restrooms, a restaurant and store. To the east, there is one small motel with its own small access road and parking lot, and to the northwest, three additional motel structures, each with separate parking. Six rings of rustic cabins are north of the Restaurant/Store, with common shower facilities in general proximity.

A service and trash collection area behind the store is adjacent to some of the guest cabins. It is unrestricted from public access, unscreened from view and also attracts bears.

In 2000, an assessment was conducted of the condition and code compliance of concessioner-operated Swiftcurrent buildings. These 49 buildings vary in architecture, age and condition. Most structures were found to be in fair to good condition.

Needed work includes upgrading the electrical distribution net for the cabins and motels; treating severe weather damage to wood shingle roofing and window/door frames; correcting water and sewer system problems in the cabins and the renovation of the basement of the Restaurant/Store. The basement has egress issues, unrated fire separation walls, poor heating and ventilation, and is prone to flooding. Other issues are poor painted surfaces on wood siding, and damage from drifting snow to exposed walls and floor structures.

Other health safety concerns need to be addressed by projects to improve ADA accessibility around the site, stabilize structural problem areas, remove areas damaged by moisture in wooden structures and re-anchor loose metal roof panels. Significant renovations have been made to the Restaurant/Store building, Laundry/Showers facility and some of the motels.

- *Circulation:* Many Glacier and Swiftcurrent are connected by roads and trails. A small visitor center and ranger station are on the approach road to Swiftcurrent, which terminates in a large parking area. The Swiftcurrent Motor Inn is on one side of the parking area and a large campground is on the other. A small access road connects the different areas of the site and there is a small parking lot near the motel units for visitors who use the trails. Most of the paved surfaces in the site are in poor condition.

Pedestrian circulation through the site is poorly defined, resulting in many informally created routes. Pedestrian conflicts with vehicles occur nearly everywhere.

(See Map 2-19. Swiftcurrent Existing Features: Cultural, Visitor Use, Buildings.)

Swiftcurrent Site Alternatives

The goal is to maintain Swiftcurrent as a developed area separate from Many Glacier, and provide traditional visitor and support services for both the National Park Service and the concessions operation. In accordance with the General Management Plan, nationally significant resources such as the family lodge would be preserved and continue to be used for visitor services.

The overall objectives for the Swiftcurrent developed area are to:

1. Comply with life safety, accessibility and building codes.
2. Reinforce and maintain the historic auto camp character and enhance historic experience.
3. Promote pedestrian use of the area with separate circulation for vehicles.
4. Enhance visitor experiences by improving:
 - Visitor services,
 - Orientation, information, and interpretive opportunities,
 - Sense of arrival,
 - Separation of guest and employee functions.
5. Improve employee housing and recreation.



MAP 2-20. SWIFTCURRENT ALTERNATIVE AREAS

Alternative A (status quo/no action) retains all existing services and facilities, and addresses life safety, accessibility and building deficiencies as funding allows. Both budget and standard guest accommodations would be retained. Improvements would provide another 25+ years of useful life. This alternative is also a component of Alternatives B and C.

ALTERNATIVE A ACTIONS WOULD:

Area I

- Continue existing services:
 - Overnight guest accommodations
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.

Area II

- Continue existing services:
 - Overnight guest accommodations
 - Employee housing and related facilities
 - Public showers and laundry
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.

Area III

- Continue existing services:
 - Food and beverage services
 - Retail sales
 - Public restrooms and pay phones
 - Public shuttle and tours
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.

Alternative B (Preferred) would continue all the existing services, however the historic auto camp cabin experience would be enhanced. All overnight guest accommodations would be provided in cabins (budget and standard type accommodations). Additional cabins would be added to fill in existing cabin circles and new circles would be created where the employee bath house and motel currently exist. Employee housing and other employee functions would be better separated from the guest activities by concentrating those functions in the existing motel area. Improvements to parking would enhance the sense of arrival and provide for safer wildlife viewing and interpretation areas. Public shower facilities would be expanded. Vehicular and pedestrian circulation would be improved to promote safety and better navigation throughout the area.

ALTERNATIVE B ACTIONS WOULD:

Area I

- Include these services:
 - Employee housing and related facilities
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct trail network to Area III and separate vehicle and pedestrian circulation.
- Add low-level lighting to better serve the motel area.
- Convert Motels 1, 2 and 3 from guest to employee housing.
- Construct a fourth motel for employee housing, employee recreation, employee laundry and housekeeping services near Motels 1, 2 and 3.
- Construct a new outdoor recreation area.
- Modify vehicle circulation and retain trailhead parking.
- Relocate trailhead parking and trailhead to main parking lot in Area III.

Area II

- Include these services:
 - Overnight guest accommodations
 - Public showers and laundry
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Formalize the trail network separating vehicle and pedestrian circulation.
- Add low-level lighting to better serve the cabin area.
- Convert the cabin area road to a one-way loop road.
- Remove parking from the inside cabin rings and relocate along the cabin area road.
- Convert cabins formerly used for employee housing to guest accommodations.
- Remove the Bath House and Motel 4.
- Construct approximately three new cabin rings for guest accommodations in the area formerly occupied by the Bath House and Motel 4.
- Fill in the three existing cabin rings for additional guest accommodations.
- Modify vehicle circulation and convert two-way vehicle circulation to one-way traffic.
- Remodel public shower facilities to increase capacity.

Area III

- Include these services:
 - Food and beverage services
 - Retail sales
 - Public restrooms and pay phones
 - Public shuttles and tours
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Redesign the existing parking apron in front of the restaurant and store to allow safe pedestrian access and adequate space for interpretive talks and wildlife viewing.
- Realign and make the west access road one-way to overnight accommodations; construct additional visitor/guest parking and formalize employee parking adjacent to the restaurant and store.
- Construct trail network to Area I, and separate vehicle and pedestrian circulation.
- Create new trailhead at main parking area
- Add low-level lighting to better serve guests and employees.

Alternative C would retain all the existing services and the current mix of cabin and motel guest accommodations. A few additional cabins would be added to fill in cabin circles and a new motel added near the existing motel to replace the motel that is converted to employee housing. Both budget and standard accommodations would be retained. Concentrating new and existing employee housing and recreation facilities on the east side of the complex would attain the best separation of employee and guest activities. Improvements to parking would enhance the sense of arrival and the cabin circle concept. Safer wildlife viewing and interpretation areas would be created. Vehicular and pedestrian circulation would be improved to promote safety and better navigation throughout the area.

ALTERNATIVE C ACTIONS WOULD:

Area I

- Include these services:
 - Overnight guest accommodations
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Construct new guest motel in the vicinity of Motels 1, 2 and 3, including housekeeping and maintenance facilities.

Area II

- Include these services:
 - Overnight guest accommodations
 - Employee housing and related facilities
 - Public showers and laundry
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Convert Motel 4 to employee dormitories and expand employee parking.
- Construct new employee dormitories, showers, and indoor and outdoor recreation facilities adjacent to Motel 4.
- Formalize the trail network separating vehicle and pedestrian circulation.
- Add low-level lighting to better serve the cabin area.
- Remove the Bath House.
- Remove parking from the inside cabin rings and relocate on the perimeter.
- Construct new cabin ring for employee housing and fill in existing employee cabin ring with one cabin.
- Complete two existing guest cabin rings for additional guest accommodations.
- Remodel public shower facilities to increase capacity.

Area III

- Include these services:
 - Food and beverage services
 - Retail sales
 - Public restrooms and pay phones
 - Public shuttle and tours
- Upgrade facilities and utilities to comply with life safety, accessibility and building codes.
- Realign and make the west access road one-way to overnight accommodations; construct additional visitor/guest parking and formalize employee parking adjacent to the restaurant and store.

See Appendix 2 for prescriptions and standards.

See Appendix 4 for additional information on existing and proposed services and facilities.

SWIFTCURRENT
Alternative B — Preferred

The preferred alternative is B because it provides good separation of guest and employee functions and expands the guest experience by offering more cabin-style accommodations, some with bathrooms. These new units would replace the “mid-range” or standard accommodations currently provided in the motel. This alternative could accommodate some employees currently housed in the Many Glacier Hotel and provide a variety of other housing to accommodate different needs of employees.

Swiftcurrent
Preferred Alternative

ACTIONS COMMON TO ALL ALTERNATIVES

This section contains a description of actions that would occur regardless of the alternative chosen. The actions include commercial services that remain the same, regardless of the alternatives.

OPERATING DATES FOR SIX DEVELOPED AREAS

Under all of the action alternatives, a new range of operating dates are proposed. Table 2-1 Typical and Proposed Operating Dates for Concession Facilities shows the typical and proposed range of operating dates for concession facilities at each developed area. The typical dates were determined by using an average of opening and closing dates over the last 10 years.

TABLE 2-1 TYPICAL AND PROPOSED OPERATING DATES FOR CONCESSION FACILITIES

Developed Area	Typical Operating Dates	Proposed Operating Dates	Change in Weeks
Rising Sun	6/10 – 9/17	3 rd week in May – end of Sept.	5 weeks
Many Glacier	6/7 – 9/15	Beginning of June – 3 rd week in Sept.	2 weeks
Swiftcurrent	6/12 – 9/15	Beginning of June – 3 rd week in Sept.	3 weeks
Two Medicine	5/30 – 9/9	3 rd week in May – end of Sept.	4 weeks
Apgar	5/22 – 9/26	Beginning of May – end of October	8 weeks
Lake McDonald	5/31 – 9/29	Mid May – 3 rd week in October	5 weeks

The proposed ranges of dates are the outside dates that the concession facilities could operate. Facility condition, funding, wildlife activity, staffing and weather may require a shorter operating seasons and would be determined on a year-to-year basis within these time frames. None of these dates apply to services that are independent of facilities, such as road-based tours, day hiking, etc.

The operating dates for Granite Park and Sperry Chalet would continue to occur between July 1 and mid-September, depending on weather, etc.

INTERPRETATION AND ORIENTATION STANDARDS AT DEVELOPED AREAS

Orientation to the area and interpretation opportunities would be improved at each of the developed areas. These services would include improved signage, interpretive displays and/or interactive interpretation.

MINORITY HIRING

The National Park Service would continue to encourage concessioners to recruit and hire minority employees including Blackfeet, and Salish and Kootenai Tribe members.

UTILITIES AT DEVELOPED AREAS

Utility systems to service the developed areas would continue to be provided under federal and state regulations. Improvements to these systems might be necessary to support existing and proposed facilities and would continue as funding allows. Utility improvements are not analyzed in this document. Separate compliance would be needed.

BOAT RENTALS

Small boat rentals would continue to be provided by the boat tour concessioner at Two Medicine and Swiftcurrent Lakes, and Lake McDonald. The boat tour concessioner would provide rental of fishing equipment at its existing facilities.

GUIDED BACKPACKING SERVICES

Commercially guided backpacking services would continue to be provided parkwide. Group size, locations for overnight camping, and number of backcountry permits issued per season would continue to be limited and regulated by a National Park Service operating plan. No guided off-trail hiking or climbing would be allowed. Trips could continue to occur in all management areas and across all zones, although campsites would be located only in the backcountry zones. Services would continue to be subject to restrictions already in effect for the North Fork management area identified in the 1999 General Management Plan (NPS 1999). No administrative facilities would be provided in the park.

No other alternatives are considered for this service. Backcountry campsites are limited and allocation of a larger percentage of these sites to commercially guided trips would further restrict the sites available to visitors without a guide.

EQUIPMENT RENTAL, CHILD CARE AND COMMERCIAL ENTERTAINMENT

These services would be accommodated within existing facilities at the developed areas based on the prescriptions and standards.

SPERRY CHALET

Sperry Chalet would continue to provide private overnight guest accommodations with full services (accommodations, bedding, meals and housekeeping services) and housing for up to eight employees. The chalet would continue to be accessible by foot or horse traffic only. The 1993 plan for the chalet has been implemented and because no issues or concerns were raised during scoping, no alternatives are considered.

GUIDED RAFTING

Commercially guided rafting would continue to be provided on the Middle and North Forks of the Flathead River under the conditions of a permit issued by the U.S. Forest Service under the authority of the Wild and Scenic River Act. Overnight camping is not permitted inside the park as part of these trips. No facilities are currently provided in the park. No other alternatives are considered for this activity because the management and permitting of these operations are under the jurisdiction of the U.S. Forest Service.

EMERGENCY ROAD SERVICES

Private service providers outside the park would continue to provide emergency road services in the visitor service and rustic zones in the park. The park would continue to maintain a list of eligible operators and, if no request were made for a particular operator, operators would continue to be called on a rotational basis to provide service. No administrative facilities would be provided in the park. No

other alternatives are considered for this service due to complications arising from agreements that organizations such as automobile clubs and rental car companies have with particular vendors.

GUIDED CROSS-COUNTRY SKIING/SNOWSHOEING

Commercially guided cross-country skiing and snowshoeing services would continue to be provided in all management areas and across all zones with the exception of the North Fork management area, where these services could continue to be provided only along the visitor service zone. Activities would take place between November 20 and May 1. Client-to-guide ratio and group size limits would continue to be determined by a permit. Guided activities would continue to include day and overnight trips. Camping permits would continue to be required. No administrative facilities would be provided in the park.

No other alternatives are being considered because the current and anticipated demand and associated impacts from this activity are not sufficient to warrant further opportunities at this time.

GUIDED PHOTOGRAPHY AND ART SEMINARS

Commercially guided photography and art seminars would continue to be provided across all zones in all management areas of the park except the North Fork area. Services in the North Fork visitor service zone would continue to be limited to the area south of the Camas Road. No off-trail activities would be permitted. No administrative facilities would be provided in the park.

No other alternatives are considered for this activity because the current and anticipated demand for this service, as well as the impacts associated with the service, are low.

CATERED MEAL SERVICES

Commercially catered meals would continue to be provided in designated picnic areas for special events, groups, or meetings under the conditions of a special use permit or in concession-operated facilities by an authorized concessioner.

No other alternatives are being considered for this type of meal service because no alternatives exist.

MITIGATION

The following is a list of mitigation measures that would be adhered to during construction and/or operation of the commercial services as appropriate. These measures are in addition to any state or local requirements.

- **Water Quality**

The following mitigation measures would be applied to protect water quality.

- Silt fences, sedimentation basins, turbidity barriers, etc. would be used in construction areas near water to reduce erosion and discharge to water bodies.
- Hazardous waste materials would be



- removed immediately from project sites.
- Construction debris would be placed in refuse containers daily and would be disposed of weekly.
- Volatile wastes and oils would be disposed of in approved containers for removal from construction sites to avoid contamination of water bodies.
- A hazardous spills plan would be developed prior to any construction, and absorbent pads, booms and other materials would be kept on site during projects that use heavy equipment in order to contain oil, hydraulic fluid, solvents and hazardous material spills.
- Water conservation measures would continue.
- **Soils**
 - Silt fences would be erected in construction areas to reduce erosion and surface scouring.
 - Volatile wastes and oils would be disposed of in approved containers for removal from construction sites to avoid contamination of soils.
 - A hazardous spills plan would be developed prior to any construction, and absorbent pads, booms and other materials would be kept on site during projects that use heavy equipment in order to contain oil, hydraulic fluid, solvents and hazardous material spills.
 - Topsoil would be conserved from all construction activities. Soil-stabilizing matting would be used to prevent erosion before revegetation.
 - Construction, demolition and development activities would be scheduled if possible to occur when effects on soil compaction and erosion would be minimized.
- **Vegetation**
 - Revegetation plans using native species would be developed for disturbed areas. Monitoring would ensure successful revegetation. Landscaping would be compliant with the park's interim genetic guidelines for restoration projects and native species would be used in all new landscaping.
 - Noxious weed abatement would be implemented prior to construction.
 - Base course and fill materials would be selected for compatibility with native soils to minimize the risk of introducing non-native plant seeds.
 - Construction operations would be confined to specified project work limits by temporary barriers or flagging.
 - If possible, construction would be scheduled when effects on vegetation would be minimized, such as during particular seasons.
- **Wildlife**
 - Construction, demolition and development activities would be scheduled when effects on wildlife would be minimized, such as during particular seasons or times of the day.
 - Routes of escape from excavated pits and trenches would be maintained for animals that might fall in, and appropriate actions would be taken to free animals caught in excavations.
 - Concessioner guides would be trained in safety and proper behavior around wildlife to protect wildlife from habituation.
 - Construction areas would be kept clean and refuse would be disposed of regularly to reduce wildlife contact with refuse or hazardous materials.
 - Wildlife activity would be monitored during construction.
- **Natural Sound**
 - Construction activities would be scheduled to minimize noise impacts.
- **Air Quality**
 - Best-available clean fuel technology would be used to minimize emissions.

- Dust abatement measures would be implemented and would include watering or otherwise stabilizing soils, covering haul trucks, employing speed limits on unpaved roads, minimizing vegetation clearing and revegetating disturbed areas.
- **Historic Resources**
 - Rehabilitation, modern facilities and new development would follow “The Secretary of the Interior’s Standards for the Treatment of Historic Properties” (Secretary of the Interior 1995). Consultation with the State Historic Preservation Office would be ongoing as required by Section 106 of the National Historic Preservation Act.
- **Archeological and Ethnographic Resources**
 - Archeological surveys would be conducted in unsurveyed areas.
 - If archeological resources were discovered during construction, activities at those specific sites would cease and appropriate measures would be taken to evaluate the significance of the resources.
- **Scenic/Visual Resources**
 - Building materials would be sustainable and visually compatible with the landscape or the historic district.
 - Vegetative screening would be provided where applicable and consistent with cultural landscapes.
- **Energy Consumption**
 - Energy consumption would be mitigated by applying energy conserving technologies in the design of new facilities. Sustainable and energy efficient building materials and sustainable components, as well as best-available fuel technology would be used during construction.

ALTERNATIVES AND IDEAS CONSIDERED BUT REJECTED

A variety of concepts and specific ideas for site improvements and commercial services were considered during the planning process, but were eliminated from further consideration due to resource concerns, physical constraints of the sites, financial feasibility, and ability to meet necessary and appropriate criteria.

Alternatives and previous plans considered but rejected. Development concept plans and environmental assessments were completed during the late 1980s and early 1990s for most of the developed areas, including:

- Apgar Village (1981/82)
- Lake McDonald Lodge (1986 with update in 1991)
- Rising Sun (1986)
- Swiftcurrent (1986)
- Many Glacier (1986)

These development concept plans were reviewed and although some of the issues addressed in these plans are still relevant, many are no longer valid. Additionally, the scope of this *Draft CSP and Draft EIS* encompasses many issues that were not addressed in the prior planning studies. However, where applicable, components of previous development proposals were incorporated into the conceptual site development alternatives presented.

Housing all concession employees outside of the park. This idea was rejected because temporary housing outside the park is limited on the east and west sides of the park. Concessioners would be

required to purchase land and construct housing and/or lease property, which was determined to be financially infeasible. Furthermore, housing most, if not all employees outside the park raised concerns about the economics and logistics of providing transportation for employees from those areas to work sites inside the park, causing additional traffic on the roads and the need for additional parking.

Alternative employee housing. An alternative form of employee housing was explored. Trailer pads and hook-ups would be supplied for employees who supply their own recreational vehicle housing, allowing concessioners to benefit from a more diverse employee labor pool. This idea was rejected for the west side of the park because arrangements could be made with several commercial campgrounds in the vicinity of the park. On the east side of the park, there are also some options for this type of accommodation outside the park and no suitable area inside the park could be located that did not adversely impact viewsheds, wildlife habitat or other sensitive resources.

Constructing a third story on the Village Inn in Apgar Village. This idea was rejected because adding a third story would increase the inn's visibility on the shore of Lake McDonald. It would also be an inconsistent design element in the Apgar Village.

Providing overnight lodging for the public in existing structures at the Two Medicine developed area. This idea was rejected because of the small size of the Two Medicine General Store (previously a dining hall) and the financial limitations of operating a small overnight facility.

Providing additional concessioner employee housing at Packer's East in the Many Glacier developed area. This idea was rejected due to the limitation of suitable land, visual impacts from the main road and potential impacts to wildlife and travel corridors. Housing employees at this site would require a parking and/or a transportation system of some kind to transport employees to the work sites, increasing operational costs.

Guided sea-kayaking classes. This idea was rejected because this type of technique- or skills-based instructional course fails to meet the criteria for a "necessary" commercial activity. Sea kayaks could be rented by the small boat rental concession, or individuals could bring their own kayaks and undertake this activity on their own. A commercially guided activity of this nature is not considered necessary for park visitors.

Commercially Operated Campgrounds

Although two campgrounds (Fish Creek and St. Mary) have a commercially operated reservations system as part of a nationwide National Park Service contract, conversion of the remainder of the campgrounds to commercial operations was considered but rejected at this time. The park currently uses a significant portion of its campground receipts to fund park rehabilitation projects and fee collection activities. It is not to the park's advantage at this time to lose that source of revenue. At some point in the future, the National Park Service's servicewide requirements or financial need may require reconsideration of this service.

The following commercial activities or services were considered during scoping. These activities are prohibited in Glacier National Park by regulation or policy.

Ballooning (take-off or landing)

Base jumping

Commercial fishing

Gambling
Hang gliding
Heli-hiking
Heli-skiing
Hunting
Jet skiing
Parasailing
Snowmobiling
Fish stocking

The following commercial services were suggested by the public, but failed to meet the necessary and appropriate criteria.

Commercial instruction (skill- or technique-based instruction)
Crystal reading
Gas stations
Guided dog sled services
Guided fishing
Guided ice climbing services
Guided rock climbing services
Horse drawn carriage services
Horse drawn sleigh services
Kennel services
Marina services
Personal services (beauty shops, barber, massage)

ENVIRONMENTALLY PREFERRED ALTERNATIVES

The environmentally preferred alternative is determined by applying the criteria in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provided direction that the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's 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 esthetically 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 will 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.

The National Park Service evaluated the environmental consequences for all of the alternatives. While the results of the *Draft Environmental Impact Statement* indicate that alternative A (status quo/no action) may involve the fewest impacts to environmental and historical resources, this alternative does not satisfy the purpose and need underlying the proposed actions.

TABLE 2-2 ENVIRONMENTALLY PREFERRED ALTERNATIVES

	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6
Granite Park Chalet	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: No	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: No	Alt. A: No Alt. B: Yes Alt. C: No
Guided Day Hiking	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes
Guided Underwater Diving	Alt. A: Yes Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: No
Firewood Sales	Alt. A: Yes Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: Yes Alt. B: No	Alt. A: Yes Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: No Alt. B: No
Public Showers	Alt. A: Yes Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: No Alt. B: No
Boat Tours & Transportation	Alt. A: Yes Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: No Alt. B: No
Interpretive Vehicle Tours and Public Transportation	Alt. A: Yes Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes
Horseback Riding and Packing Services	Alt. A: Yes Alt. B: Yes Alt. C: No Alt. D: Yes	Alt. A: Yes Alt. B: Yes Alt. C: No Alt. D: Yes	Alt. A: No Alt. B: No Alt. C: No Alt. D: Yes	Alt. A: Yes Alt. B: No Alt. C: Yes Alt. D: No	Alt. A: Yes Alt. B: No Alt. C: Yes Alt. D: No	Alt. A: No Alt. B: No Alt. C: No Alt. D: Yes
Guided Bicycle Tours	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: No	Alt. A: No Alt. B: Yes	Alt. A: Yes Alt. B: Yes
Commercial Step-On Guide Services	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: No	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: No
Guided Motorcycle Tours	Alt. A: No Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: No
Apgar Village	Alt. A: Yes Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: Yes Alt. C: No	Alt. A: Yes Alt. B: Yes Alt. C: No	Alt. A: Yes Alt. B: Yes Alt. C: No
Lake McDonald	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: No Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: Yes Alt. C: Yes
Rising Sun	Alt. A: Yes Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: No Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: Yes Alt. C: Yes
Two Medicine	Alt. A: Yes Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: Yes Alt. B: Yes	Alt. A: No Alt. B: Yes	Alt. A: Yes Alt. B: Yes
Many Glacier	Alt. A: Yes Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: No Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: Yes Alt. C: Yes
Swiftcurrent	Alt. A: Yes Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: Yes Alt. C: No	Alt. A: No Alt. B: Yes Alt. C: Yes	Alt. A: Yes Alt. B: Yes Alt. C: Yes

Yes = Achieves the environmentally preferred criteria stated above.

No = Does not achieve the environmentally preferred criteria stated above.

Bold type = Environmentally preferred alternative

COSTS OF ALTERNATIVES

The following estimates do not include costs for prospective businesses to develop their businesses or additional operating and capitalized costs for concessioners to add equipment or services. Estimates also do not include increased National Park Service administrative costs.

TABLE 2-3 COST ESTIMATES FOR NECESSARY AND APPROPRIATE SERVICES

Necessary and Appropriate Service	Total Costs
Granite Park Chalet	
Alternative A – Status Quo/No Action	No additional capital costs
Alternative B	Capital costs estimated at \$1.65 million
Alternative C	Capital costs estimated at \$2.38 million
Guided Day Hiking (Cultural/Natural/Recreational)	
Alternative A – Status Quo/No Action	No additional capital costs
Alternative B*	No additional capital costs
Guided Underwater Diving Tours	
Alternative A – Status Quo/No Action	No additional capital costs
Alternative B*	No additional capital costs
Firewood Sales	
Alternative A – Status Quo/No Action	No additional capital costs
Alternative B*	If the method of delivery is constructed sheds or vending machines, the costs for this construction would be born by the operator and have not been estimated.
Public Showers	
Alternative A – Status Quo/No Action	No additional Costs
Alternative B*	\$900,000 additional capital costs (does not include operational and maintenance costs)
Boat Tours and Transportation	
Alternative A – Status Quo/No Action	See capital improvements captured in site discussion
Alternative B	See capital improvements captured in site discussion
Guided Interpretive Motor Vehicle Tours and Public Transportation	
Alternative A – Status Quo/No Action	No additional capital costs
Alternative B*	No additional capital costs for tours, taxi or private shuttle. Capital costs for expanded shuttle are addressed in a interim transit system plan under the <i>Going-to-the-Sun Road Rehabilitation Plan/Draft EIS</i>
Horseback Riding and Horse Packing Services	
Alternative A – Status Quo/No Action	No additional capital costs
Alternative B	No additional capital costs
Alternative C*	No additional capital costs, however, additional trails maintenance costs would be incurred.
Alternative D	Costs for removal of the Lake McDonald Stables and restoration of the site as a public stock loading ramp and parking would be approximately \$90,190. Costs for additional housing and expanded corral facilities at Apgar would be approximately \$210,000.
Guided Bicycle Tours	
Alternative A – Status Quo/No Action	No additional capital costs
Alternative B*	No additional capital costs.
Commercial Step-On Guide Service	
Alternative A – Status Quo/No Action	No additional capital costs
Alternative B*	No additional capital costs
Guided Motorcycle Tours	
Alternative A – Status Quo/No Action	No additional capital costs
Alternative B*	No additional capital costs

* In most cases, implementation of any one of these asterisked alternatives would not cause substantial increased National Park Service administrative costs or staffing needs. However, implementing several of these asterisked alternatives together would increase NPS administrative costs and staffing needs.

The following are 2002 class D total project cost estimates. The estimates include construction costs, project planning, construction supervision and contingencies. Estimates also include National Park Service project management costs. They were prepared by the staff at Architectural Research Consultants, Inc. using the baseline work from the Assessment of Condition Report in 2001. Costs do not include needed improvements to site utility infrastructure.

TABLE 2-4 COST ESTIMATES FOR DEVELOPED AREAS

Developed Area	Work Related to Roads and Trails	Work Related to Buildings and Building Utilities	Total Project Costs
Apgar			
Alternative A – Status Quo/ No Action	\$ 208,000	\$ 274,000	\$ 481,000
Preferred Alternative B	\$ 1,016,000	\$ 979,000	\$ 1,995,000
Alternative C	\$ 1,888,000	\$ 5,194,000	\$ 7,082,000
Lake McDonald			
Alternative A – Status Quo/ No Action	\$ 43,000	\$ 6,328,000	\$ 6,372,000
Alternative B	\$ 992,000	\$ 13,878,000	\$ 14,870,000
Preferred Alternative C	\$ 1,154,000	\$ 18,152,000	\$ 19,306,000
Rising Sun			
Alternative A – Status Quo/ No Action	\$ 93,000	\$ 3,895,000	\$ 3,988,000
Alternative B	\$ 593,000	\$ 6,640,000	\$ 7,233,000
Preferred Alternative C	\$ 626,000	\$ 9,718,000	\$ 10,345,000
Two Medicine			
Alternative A – Status Quo/ No Action	\$ 44,000	\$ 814,000	\$ 858,000
Preferred Alternative B	\$ 521,000	\$ 897,000	\$ 1,419,000
Many Glacier			
Alternative A – Status Quo/ No Action	\$ 583,000	\$ 23,611,000	\$ 24,194,000
Alternative B	\$ 1,923,000	\$ 25,700,000	\$ 27,624,000
Preferred Alternative C	\$ 2,101,000	\$ 34,936,000	\$ 37,037,000
Swiftcurrent			
Alternative A – Status Quo/ No Action	\$ 166,000	\$ 2,518,000	\$ 2,684,000
Preferred Alternative B	\$ 1,045,000	\$ 8,476,000	\$ 9,521,000
Alternative C	\$ 973,000	\$ 8,396,000	\$ 9,369,000
Total Preferred Alternatives	\$ 6,463,000	\$ 73,153,000	\$ 79,623,000

SUMMARIES OF ALTERNATIVES

TABLE 2-5 SUMMARY OF ALTERNATIVES: GRANITE PARK CHALET

GRANITE PARK CHALET			
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C	Alternative D
Current conditions as a hiker shelter would be maintained. No new services would be provided and no improvements would be made.	Current conditions as a hiker shelter would be maintained. Also, potable water would be made available and expanded toilet facility would be constructed.	Full-service dining and overnight facilities would be provided. The water system would be replaced. An expanded gray water system and enhanced toilet facility would be constructed.	

TABLE 2-6 SUMMARY OF ALTERNATIVES: GUIDED DAY HIKING

GUIDED DAY HIKING			
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C	Alternative D
Commercially guided day hiking would continue to be provided with no limits on group size or trails that could be used. Activities would continue to occur across all zones and in all management areas except the North Fork.	Commercially guided day hiking would be provided and client-to-guide ratios specified. Group size would be limited to 12 people on most backcountry trails. Larger group sizes (not to exceed 50) would be permitted on specified day use trails. Guided day hiking would not be authorized in the North Fork area. Limitations would be placed on the number of daily guided hikes on backcountry zone trails. An annual parkwide cap of 5,000 user days would be imposed.		

TABLE 2-7 SUMMARY OF ALTERNATIVES: GUIDED UNDERWATER DIVING TOURS

GUIDED UNDERWATER DIVING TOURS			
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C	Alternative D
No commercially guided underwater diving activities would occur.	Commercially guided underwater diving tours could be provided in Lakes McDonald and Sherburne, and Josephine, Swiftcurrent, Two Medicine, Pray, Lower Two Medicine and St. Mary Lakes. All participants would be fully certified divers.		

TABLE 2-8 SUMMARY OF ALTERNATIVES: FIREWOOD SALES

FIREWOOD SALES			
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C	Alternative D
Firewood sales would continue to take place in local camp stores, the Apgar Village, Lake McDonald Lodge, Rising Sun, Two Medicine and Swiftcurrent developed areas.	Firewood sales could be provided in specific campgrounds in the visitor service zones and in camp stores.		

TABLE 2-9 SUMMARY OF ALTERNATIVES: PUBLIC SHOWERS

PUBLIC SHOWERS			
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C	Alternative D
Public showers would continue to be provided to a limited extent in the Rising Sun and Swiftcurrent developed areas. Shower facilities could be expanded within the existing facilities.	Additional shower facilities could be constructed at or near specified campgrounds in the visitor services zones and/or existing public showers could be expanded.		

TABLE 2-10 SUMMARY OF ALTERNATIVES: BOAT TOURS AND TRANSPORTATION (BOAT TAXI)

BOAT TOURS AND TRANSPORTATION (BOAT TAXI)			
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C	Alternative D
Current interpretive boat tours would continue to be provided on Lakes McDonald and Josephine, and St. Mary, Two Medicine, Swiftcurrent and Waterton Lakes. Boat taxi or boat transportation would continue to be provided with the existing tour boats. Upgrades to comply with life safety, accessibility and building codes would be made as funding is available. Tour boats and/or docks would be modified as necessary to improve access for the mobility-impaired.	In addition to the services provided in alternative A, services could be expanded to include tour boat pick-up in Apgar Village. Services could also be expanded to add another vessel at Lake McDonald and Two Medicine Lake. Upgrades to comply with life safety, accessibility and building codes would be made as funding is available. Tour boats and/or docks would be modified as necessary to improve access for the mobility-impaired.		

**TABLE 2-11 SUMMARY OF ALTERNATIVES:
GUIDED INTERPRETIVE VEHICLE TOURS AND PUBLIC TRANSPORTATION**

GUIDED INTERPRETIVE VEHICLE TOURS AND PUBLIC TRANSPORTATION			
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C	Alternative D
<p>Motor vehicle tours would continue to be provided.</p> <p>Shuttle service would continue to be provided in the Many Glacier Valley and along Going-to-the-Sun Road.</p> <p>Taxi services would continue to limited destinations in the park. Taxi services would continue to be prohibited in the North Fork, on the inside North Fork Road, and on the section of Going-to-the-Sun Road between the Lake McDonald and Rising Sun developed areas.</p> <p>Commercial shuttling of private vehicles would not be provided.</p>	<p>In addition to motor vehicle tour services provided in alternative A, operating restrictions would be changed to lift restrictions on the Going-to-the-Sun Road. No tour services would be provided in the North Fork.</p> <p>Shuttle service would continue to be provided in the Many Glacier Valley and along Going-to-the-Sun Road.</p> <p>Operating restrictions would be changed to allow expansion of taxi services to include Going-to-the-Sun Road.</p> <p>Commercial shuttling of private vehicles could be provided to trailheads and designated locations within the visitor service zones of all management areas (except the North Fork) and in the rustic zones in the Two Medicine area and Going-to-the-Sun Road corridor.</p>		

**TABLE 2-12 SUMMARY OF ALTERNATIVES:
HORSEBACK RIDING AND HORSE PACKING SERVICES**

HORSEBACK RIDING AND HORSE PACKING SERVICES			
Alternative A - Status Quo/No Action (PREFERRED)	Alternative B	Alternative C	Alternative D
<p>The Apgar, Lake McDonald and Many Glacier stables would provide horseback riding. Packing services to Granite Park and Sperry chalets would continue. "Drop trip" packing services would continue to be provided to back-country campsites where horse traffic is permitted. Current client-to-guide ratios, group size limits and limits on stock numbers held at each stable</p>	<p>Services and upgrades would be provided as described in alternative A except that the Apgar stables would be maintained as a base for packing operations, but no trail rides would originate from that location.</p>	<p>In addition to continuing services and upgrades at the stables at Apgar, Lake McDonald and Many Glacier as in alternative A, guided horseback riding trips in the Two Medicine and St. Mary areas would be permitted. No facilities would be constructed or installed. All stock would be maintained outside the park and transported to and from the park to support these new</p>	<p>Services and upgrades would continue as in alternative A at Apgar and Many Glacier, and the Lake McDonald stables would be removed.</p> <p>The Lake McDonald stables site would be used for trailhead parking and a public stock-loading ramp would be installed. Rides would only be permitted to Sperry Chalet from this location.</p>

HORSEBACK RIDING AND HORSE PACKING SERVICES			
would be maintained. Upgrades to comply with life safety, accessibility and building codes would be made as funding is available.		services. Rides would be limited to one trip per day per trail, with a total group size of 10.	Additional housing could be constructed and the corral enlarged at the Apgar stables.

TABLE 2-13 SUMMARY OF ALTERNATIVES: GUIDED BICYCLE TOURS

GUIDED BICYCLE TOURS			
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C	Alternative D
Commercially guided bicycle tours would continue to be provided in the visitor service zones of all management areas except the North Fork. Services would also continue to be provided in the rustic zones of the Apgar Lookout, the 1913 Ranger Station and the Cut Bank area. Off-road bicycle use would continue to be prohibited. There would continue to be no limits on group size, number of groups per day, or number of operators.	Limits on group size and number of groups that could cross Going-to-the-Sun Road per day would be applied to current guided bicycle tour conditions. There would be an allocation system to distribute opportunities between operators.		

TABLE 2-14 SUMMARY OF ALTERNATIVES: COMMERCIAL STEP-ON GUIDE SERVICES

COMMERCIAL STEP-ON GUIDE SERVICES			
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C	Alternative D
No commercial step-on guide services would occur.	Commercial step-on guide services could be provided. A step-on guide could ride along with individuals in their own vehicles and give an interpretive tour of the park. These services would be provided only in those areas of the park that are unrestricted to commercial tour operations.		

TABLE 2-15 SUMMARY OF ALTERNATIVES: GUIDED MOTORCYCLE TOURS

GUIDED MOTORCYCLE TOURS			
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C	Alternative D
No guided motorcycle tours would occur.	Commercially guided motorcycle tours could be provided in visitor service zones of all management areas of the park except in the North Fork, where commercial tours are not		

GUIDED MOTORCYCLE TOURS			
	allowed except on the Camas Road. Limited group size and number of groups that could cross the Going-to-the-Sun Road per day would be established. No administrative facilities would be provided in the park.		

TABLE 2-16 SUMMARY OF ALTERNATIVES: APGAR VILLAGE DEVELOPED AREA

APGAR VILLAGE		
AREA I		
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
<p>Area I would continue to provide motel-style overnight guest accommodations, and tour boat and public boat dock access. Limited employee housing would also continue to be available.</p> <p>Existing facilities would be upgraded to comply with basic life safety, building code and access issues.</p> <p>The shore of Lake McDonald in front of the Village Inn would be stabilized.</p> <p>Accessible trails and walks would be added.</p>	<p>Area I would continue to provide the services described in alternative A.</p> <p>Primary access into rooms at the Village Inn would shift to the parking lot side and private seating areas would be provided for each unit at the lakeside. The shoreline in front of the Village Inn would be stabilized and accessible trails and walks would be added.</p> <p>Parking in the Lake McDonald viewshed would be relocated and a green space developed for the public along the shoreline. Roadside parking would be formalized or relocated to off-road areas and additional oversized parking would be provided.</p> <p>Existing facilities would be upgraded to comply with basic life safety, building code and access issues.</p>	<p>Area I would continue to provide the services described in alternatives A and B, except the Village Inn would be removed and replaced with a new hotel in Area II.</p> <p>The Village Inn site would be rehabilitated with landscaping, trails and public seating.</p> <p>Parking in the Lake McDonald viewshed would be relocated and a green space developed for the public along the shoreline. Roadside parking would be formalized or relocated to off-road areas and additional oversized parking would be provided.</p> <p>Existing facilities would be upgraded to comply with basic life safety, building code and access issues.</p>
AREA II		
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
<p>The National Park Service would continue to endorse retail sales/services by businesses on private lands and horseback tour services.</p> <p>Existing facilities would be upgraded to comply with basic life safety, building code and access issues.</p> <p>New accessible trails and walks in the village would be developed.</p>	<p>Area II would continue to provide services as described in alternative A. Parking along Apgar Loop Road would be relocated to off-road areas and additional oversized parking would be provided near the public boat dock.</p> <p>The bicycle and pedestrian trail would be extended to the Apgar Campground.</p> <p>Existing facilities would be upgraded to comply with basic life safety, building code and access issues.</p>	<p>Area II would continue to provide services as described in alternatives A and B.</p> <p>Also, a new lodging facility to replace the Village Inn would be constructed and the Environmental Education Cabin would be removed (this service could be relocated to the future Discovery Center).</p> <p>The existing Visitor Center functions would be relocated to the future Discovery Center.</p> <p>Existing facilities would be upgraded to comply with basic life safety, building code and access issues.</p>

APGAR VILLAGE OUTSIDE AREAS I AND II		
Services would continue.	Use would continue as in alternative A. Also, the bicycle and pedestrian trail would be extended to the Apgar Campground.	Use would continue as in alternatives A and B.

TABLE 2-17 SUMMARY OF ALTERNATIVES: LAKE MCDONALD DEVELOPED AREA

LAKE MCDONALD AREA I		
Alternative A - Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
<p>Area I would continue to provide current services, including hotel-style overnight guest accommodations, employee housing, retail sales, food and beverage services, boat tours and rentals, public facilities and public shuttle and tours.</p> <p>Existing facilities, trails and walks would be upgraded to comply with basic life safety, accessibility and building codes.</p>	<p>Area I would continue to provide the services described in alternative A, except most employee housing and support services would be relocated to Area II.</p> <p>Boys' Dormitories 1 and 2, and Jammer, Johnson and Hydro Dormitories would be removed. Remaining facilities, trails and walks would be upgraded as described in alternative A. Additional accessible trails and paths would be constructed to accommodate changing use.</p> <p>Cobb House Dormitory would be converted to overnight guest accommodations and Snyder Dormitory would be converted to hostel-style guest accommodations.</p> <p>The main entrance to the site would be modified to have a single point of access and parking along the boulevard would be restricted to improve the visitor's approach experience. Snyder Creek Bridge would be restricted to pedestrian, emergency and service use, with limited guest access. Vehicular access to the General Store and Coffee Shop via the boulevard would be eliminated.</p> <p>The existing indoor employee recreation facility would be converted to other visitor or management use.</p> <p>A new maintenance and laundry facility would be constructed at the former Johnson/Hydro Dormitory site, along with additional guest and employee parking.</p>	<p>Area I would provide the services described in alternative B, except that the west access road would be converted to pedestrian and bicycle use, limited service use and emergency access.</p>
AREA II		
Alternative A - Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
<p>Area II would continue to provide cabin and motel-style overnight guest accommodations, employee housing, retail sales, food and beverage services, maintenance support and horse stables.</p>	<p>Area II would continue to provide the services described in alternative A. However, maintenance support services would be relocated to Area I.</p>	<p>Area II would continue to provide the services described in alternative B, except for Stewart Motel and the Coffee Shop. The Stewart Motel would be replaced with a new motel building for overnight guest accommodations.</p>

LAKE MCDONALD		
<p>Existing facilities, trails and walks would be upgraded to comply with basic life safety, accessibility and building codes.</p>	<p>The existing Post Office building and the Girls' Dormitories 1 and 2 would be removed. The existing Coffee Shop parking area would be removed and a new, expanded parking area would be constructed between the Coffee Shop and the General Store. Remaining facilities, trails and walks would be upgraded as described in alternative A. Additional accessible hardened trails and paths would be constructed to accommodate changing facility use.</p> <p>A new pedestrian-oriented green space would be developed at the Coffee Shop parking areas.</p> <p>New public restroom facilities would be constructed at the north side of the new parking lot. The Garden Court Dormitory would be converted to overnight guest accommodations and the Coffee Shop would be modified to blend architecturally with the area. An addition would be added to the Coffee House for employee dining and a post office.</p> <p>A new employee housing village with employee support and recreation facilities would be constructed behind the existing Coffee Shop, and the Stewart Motel buildings would be converted to employee housing.</p> <p>Parking along the back of the lakeside cabin row would be eliminated and the drive restricted to pedestrian and emergency access only.</p>	<p>The Coffee Shop would be removed and a new restaurant with employee dining and post office constructed.</p> <p>Changes to vehicular and pedestrian access would be as described in alternative B, except that a new access road would be constructed, parking adjacent to guest cabin units would be formalized; and the westernmost access road (by Robert's Cabin) would be modified and converted to foot access only.</p> <p>New employee housing would be constructed as in alternative B, but would be sized, including parking, to accommodate all employees.</p>

TABLE 2-18. SUMMARY OF ALTERNATIVES: RISING SUN DEVELOPED AREA

RISING SUN		
AREA I		
Alternative A - Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
<p>Area I would continue to provide both cabin and motel-style overnight guest accommodations, and employee housing.</p> <p>Existing facilities would be upgraded to comply with basic life safety, accessibility and building codes.</p>	<p>Area I would continue to provide services and upgrades described in alternative A.</p> <p>New employee housing with associated indoor and outdoor recreation facilities and parking would be constructed just downhill from the Lower Motel.</p> <p>Approximately five 2-unit cabins would be constructed at the upper loop to replace guest accommodations that would be lost at Area II and approximately three employee cabin units would be returned to the guest accommodations.</p>	<p>Area I would continue to provide services and upgrades described in alternative A.</p> <p>New employee housing with associated indoor and outdoor recreation facilities and parking would be constructed just downhill from the Lower Motel. Also, the lower motel unit would be converted to employee housing. Boat Concessioner Housing would be provided in the new housing area.</p> <p>Approximately ten 2-unit cabins and parking would be constructed at the upper loop to replace lost guest accommodations at Area II and at</p>

RISING SUN		
	The bluff by the existing cabins would be stabilized, and trails and walks throughout the site would be improved for accessibility.	the Lower Motel. The main Dormitory would be converted to guest lodging. Approximately three employee cabin units would be returned to guest accommodations. The bluff by the existing cabins would be stabilized, and trails and walks throughout the site would be improved for accessibility.
AREA II		
Alternative A - Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
Area II would continue to provide motel-style overnight guest accommodations, employee housing and recreation facilities, food and beverage services, retail sales and other guest support services such as public showers and tour and shuttle destinations. Existing facilities would be upgraded to comply with basic life safety, accessibility and building codes.	Area II would continue to serve the same functions identified in alternative A with similar upgrades, except guest accommodations and employee housing would be relocated from the General Store/Motel and Coffee Shop buildings to Area I. The space would be renovated for additional public showers, public laundry, overnight guest registration, additional retail space and site maintenance support for the motels and cabins.	Area II would continue to serve the same functions and would complete all improvements identified in alternatives A and B. The earth berm behind the General Store would be reinforced and the intersection between the campground and General Store/Motel would be improved. Tour boats that serve St. Mary Lake would be modified to improve access for the mobility-impaired public. The Coffee Shop building would be enlarged.
AREA III		
Alternative A - Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
Area III would continue to be used as a public picnic area, a public boat launch, and for tour boat services and associated dock and Boat Concessioner Housing. Public restrooms would continue to be provided. Existing facilities would be upgraded to comply with basic life safety, accessibility and building codes.	Area III would continue to serve the same functions identified in alternative A with similar upgrades. However, the ticket booth would be relocated from the high water zone and employee housing in the building would be moved to Area I.	Area III would continue to serve the same functions and would complete improvements identified in alternative B.

TABLE 2-19 SUMMARY OF ALTERNATIVES: TWO MEDICINE DEVELOPED AREA

TWO MEDICINE		
AREA I		
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
Area I would continue to provide food and beverage services, retail sales, boat tours and rentals, and public shuttles and tours. A limited amount of employee housing would continue to be provided. No overnight guest accommodations would be provided. Existing facilities would be upgraded to comply with basic life safety, building code and access issues. The tour boats and docks serving	Area I would continue to provide services as described in alternative A with similar upgrades. The ticket booth and docks serving Two Medicine Lake would be modified for improved access for the mobility-impaired public. The viewshed of Two Medicine Lake would be improved by moving parking away from the lakefront, removing the existing restroom and replacing it with a facility in another location that is compatible with the historic character of the area. The	N/A

TWO MEDICINE		
Two Medicine Lake would be modified to provide improved access to the mobility-impaired public and the restroom would be modified for historic compatibility.	<p>exterior and landscaping of the General Store would also be restored to reflect the historic character of the area.</p> <p>A new service road and service parking would be provided for the General Store, and accessible trails would be developed to provide a link between the General Store and the campground.</p>	

TABLE 2-20 SUMMARY OF ALTERNATIVES: MANY GLACIER DEVELOPED AREA

MANY GLACIER		
AREA I		
Alternative A - Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
<p>Area I would continue to provide overnight guest accommodations and functions such as food and beverage services, retail services and visitor conveniences. Other functions such as employee housing, and public boat and vehicular tours would also continue.</p> <p>Existing facilities would be upgraded to comply with basic life safety, accessibility and building codes.</p> <p>Pedestrian circulation with access to the perimeter of the hotel and lakefront would be improved.</p>	<p>Area I would continue to provide functions similar to those described for alternative A with similar upgrades. To improve the visitor experience, historic features such as the stairwell in the lobby would be restored and non-historic functions would be relocated. The approach to the hotel would be landscaped, and service and pedestrian access around the hotel would be improved. Most employee housing would be removed from the hotel and the rooms converted to guest rooms.</p> <p>Pedestrian circulation with access to the perimeter of the hotel and lakefront would be improved.</p>	<p>Area I would continue to provide functions and modifications similar to those described for alternatives A and B.</p> <p>Also, employee recreation facilities would be removed from the hotel, further improving the visitor experience.</p> <p>Existing orientation information and/or interpretive opportunities would be improved, including restoration of some guest rooms and visitor service areas to a representative historic period.</p> <p>Pedestrian circulation with access to the hotel perimeter and lakefront would be improved, including boat ticket booth improvements.</p>
AREA II		
Alternative A - Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
<p>Area II would continue to provide guest parking, horseback riding and employee housing.</p> <p>Existing facilities would be upgraded to comply with basic life safety, accessibility and building codes.</p> <p>Pedestrian circulation with access between the parking area and the hotel would be improved.</p>	<p>Area II would continue to provide guest parking, horseback riding and employee housing with upgrades as in alternative A.</p> <p>Pedestrian circulation with access between parking area and the hotel would be improved.</p>	<p>Area II would continue to provide functions similar to those described for alternatives A and B. The Lower Dormitory would be converted to guest accommodations with improved parking. Replacement employee housing with indoor and outdoor recreation facilities would be developed in the vicinity of the Upper Dormitory.</p>
OUTSIDE AREAS I AND II		
Alternative A - Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
<p>Tour boats and docks serving Swiftcurrent Lake and Lake Josephine would be modified to provide improved access for the mobility-impaired public.</p>	<p>Improvements to existing facilities and infrastructure described in alternative A would be completed.</p> <p>The trail around Swiftcurrent Lake, and the connecting trail between Swiftcurrent Lake and Lake Josephine would be upgraded for accessibility.</p>	<p>Improvements to trails and existing facilities and infrastructure described in alternatives A and B would be completed. Also, additional employee housing would be constructed either at the Swiftcurrent site or outside the park. An employee shuttle service would be provided.</p>

MANY GLACIER		
	<p>An information/orientation pull-off would be constructed on the Many Glacier Road.</p> <p>Water and sewage systems would be improved.</p>	

TABLE 2-21. SUMMARY OF ALTERNATIVES: SWIFTCURRENT DEVELOPED AREA

SWIFTCURRENT		
AREA I		
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
<p>Area I would continue to provide motel-style overnight guest accommodations.</p> <p>Existing facilities would be upgraded to comply with basic life safety, accessibility and building codes.</p>	<p>Convert Motels 1, 2 and 3 to employee housing. Construct one additional motel building for employee housing, recreation, laundry and housekeeping. An outdoor employee recreation area would be provided.</p> <p>Vehicular circulation and parking would be reconfigured and the existing trailhead would be relocated to the main parking lot to separate the employee housing area from visitor activities. Trails to Area III would be constructed.</p>	<p>Area I would continue to provide services and upgrades as described in alternative A. Area I would continue to provide motel-style overnight guest accommodations.</p> <p>One additional motel building with a housekeeping/ laundry and maintenance facility would be constructed.</p>
AREA II		
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
<p>Area II would continue to provide cabins for overnight guest accommodations, employee housing and public shower/laundry facilities.</p> <p>Existing facilities would be upgraded to comply with basic life safety, accessibility and building codes.</p>	<p>Area II would continue to provide services and upgrades as described in alternative A, except existing employee cabins would be converted to guest use; the employee Bath House and Motel 4 would be removed and replaced with cabin guest accommodations. Additional cabins would be constructed to infill existing incomplete cabin rings.</p> <p>The public shower facility would be modified to increase shower capacity.</p> <p>Pedestrian circulation would be reconfigured to improve separation from vehicular traffic.</p> <p>Vehicular circulation in the cabin areas would be converted to a one-way loop to better separate employees and visitors. Parking would be removed from within cabin rings to areas alongside the roadway.</p>	<p>Area II would continue to provide cabin-style overnight guest accommodations, employee housing and public shower/laundry facilities.</p> <p>The area west of the loop road would be dedicated to guest accommodations and additional cabins would be constructed to infill existing incomplete cabin rings. Cabin parking would be relocated outside of the rings.</p> <p>Public shower would be modified to increase shower capacity.</p> <p>The area east of the loop road would be dedicated to employee housing. The employee bath house would be removed and replaced with an employee cabin ring. Motel 4 would be converted to employee housing. Additional employee housing would be constructed adjacent to Motel 4, along with indoor and outdoor recreation facilities and employee showers and laundry facilities.</p> <p>Existing facilities would be upgraded to comply with basic life safety, accessibility and building codes.</p>

SWIFTCURRENT		
AREA III		
Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
<p>Area III would continue to provide public services such as food and beverage service, retail sales, public restrooms, pay telephones, and shuttle and tour stop.</p> <p>Existing facilities would be upgraded to comply with basic life safety, accessibility and building codes.</p>	<p>Area III would continue to provide services and upgrades as described in alternative A.</p> <p>Vehicular circulation and parking would be reconfigured for better flow.</p> <p>Additional guest and employee parking would be provided with new viewing area.</p> <p>A new trailhead would replace the existing one at the northwest corner of Area I.</p>	<p>Area III would continue to provide services and upgrades as described in alternative A.</p> <p>Vehicular circulation and parking would be reconfigured for better flow.</p> <p>Additional guest and employee parking would be provided.</p>

SUMMARIES OF IMPACTS

See definitions of thresholds in Chapter 4.

TABLE 2-22 SUMMARY OF IMPACTS: GRANITE PARK CHALET

GRANITE PARK CHALET			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
Water Quality	Continued minor, adverse, localized, long-term impacts	Minor, positive, localized, long-term impacts	Minor, positive, localized, long-term impacts
Floodplains	No effect	No effect	No effect
Soils	No additional effects. Continued cumulative, minor, adverse, site-specific, long-term impacts.	Minor, positive, site-specific, long-term impacts	Minor, positive, site-specific, long-term impacts
Vegetation	No additional effects. Continued cumulative, minor, adverse, site-specific, long-term impacts	Minor, positive, site-specific, long-term impacts and minor, adverse, site-specific, long-term impacts	Minor, positive, site-specific, long-term impacts and minor, adverse, site-specific, long-term impacts
Wildlife, Including Aquatic Resources	No additional effect. Continued cumulative, minor, adverse, site-specific, long-term impacts	Negligible, additional adverse, site-specific, long-term impacts and minor, positive, site-specific, long-term impacts	Minor, additional adverse, site-specific, long-term impacts and minor, positive, site-specific, long-term impacts
Threatened and Endangered Species	No additional effect. Continued cumulative, minor, long-term, adverse impacts.	Moderate short-term, adverse impacts; minor, negative impacts	Moderate short-term, adverse impacts; minor, negative impacts
Natural Sound	No additional effect. Minor, adverse, short-term, localized impacts during construction and waste removal. Minor, long-term, adverse.	Minor, adverse, short-term, localized impacts during construction	Minor, adverse, short-term, localized impacts during construction
Air Quality	No effect	Negligible, adverse, short-term, localized impacts during construction	Negligible, adverse, short-term, localized impacts during construction
Historic Resources	No effect	Minor, adverse, short-term, site-specific impacts during construction	Minor, adverse, short-term, site-specific impacts during construction
Archeological and Ethnographic Resources	No effect	No effect	No effect

GRANITE PARK CHALET			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
Visual Resources	No effect	Negligible, adverse, short-term, site-specific impacts during construction	Negligible, adverse, short-term, site-specific impacts during construction
Regional and Local Communities	No effect	Negligible, short-term, positive impacts during construction	Negligible, short-term, positive impacts during construction
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	No effect
Visitor Use and Experience	No effect	Major long-term, positive impacts	Major long-term, positive impacts
Energy Consumption	No effect	Negligible, long-term, site-specific decrease	Minor, long-term, site-specific decrease
Landowners In and Adjacent to Park Boundaries	No effect	No effect	No effect

TABLE 2-23 SUMMARY OF IMPACTS: SPERRY CHALET

SPERRY CHALET			
Impact	Alternative A - Status Quo/No Action		
Water Quality	No additional effect		
Floodplains	No effect		
Soils	No additional effect		
Vegetation	No additional effect		
Wildlife, Including Aquatic Resources	No additional effect		
Threatened and Endangered Species	No additional effect		
Natural Sound	No additional effect		
Air Quality	No additional effect		
Historic Resources	No effect		
Archeological and Ethnographic Resources	No effect		
Visual Resources	No additional effect		
Regional and Local Communities	No additional effect		
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect		
Visitor Use and Experience	No additional effect		
Energy Consumption	No additional effect		
Landowners In and Adjacent to Park Boundaries	No effect		

TABLE 2-24 SUMMARY OF IMPACTS: BOAT RENTALS AND EQUIPMENT RENTALS

BOAT RENTALS AND EQUIPMENT RENTALS			
Impact	Alternative A - Status Quo/No Action		
Water Quality	No additional effect		
Floodplains	No effect		
Soils	No additional effect		
Vegetation	No additional effect		
Wildlife, Including Aquatic Resources	No additional effect		
Threatened and Endangered Species	No additional effect		
Natural Sound	No additional effect		
Air Quality	No effect		
Historic Resources	No effect		

BOAT RENTALS AND EQUIPMENT RENTALS			
Impact	Alternative A - Status Quo/No Action		
Archeological and Ethnographic Resources	No effect		
Visual Resources	No additional effect		
Regional and Local Communities	No additional effect		
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No additional effect		
Visitor Use and Experience	No additional effect		
Energy Consumption	No additional effect		
Landowners In and Adjacent to Park Boundaries	No effect		

TABLE 2-25 SUMMARY OF IMPACTS: GUIDED BACKPACKING SERVICES

GUIDED BACKPACKING SERVICES			
Impact	Alternative A - Status Quo/No Action		
Water Quality	No additional effect		
Floodplains	No effect		
Soils	No additional effect		
Vegetation	No additional effect		
Wildlife, Including Aquatic Resources	No additional effect		
Threatened and Endangered Species	No additional effect		
Natural Sound	No additional effect		
Air Quality	No effect		
Historic Resources	No effect		
Archeological and Ethnographic Resources	No effect		
Visual Resources	No additional effect		
Regional and Local Communities	No additional effect		
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No additional effect		
Visitor Use and Experience	No additional effect		
Energy Consumption	No additional effect		
Landowners In and Adjacent to Park Boundaries	No effect		

TABLE 2-26 SUMMARY OF IMPACTS: GUIDED DAY HIKING SERVICES (CULTURAL HISTORY/NATURAL HISTORY/RECREATIONAL)

GUIDED DAY HIKING SERVICES (CULTURAL HISTORY/NATURAL HISTORY/RECREATIONAL)			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Water Quality	Continued negligible, adverse, localized, long-term impacts	Negligible, adverse, localized, long-term impacts	
Floodplains	No effect	No effect	
Soils	Continued minor, adverse, localized, long-term impacts	Negligible, adverse, localized, long-term impacts	
Vegetation	Continued negligible, adverse, localized, long-term impacts	Negligible, adverse, localized, long-term impacts	
Wildlife, Including Aquatic Resources	Continued minor, adverse, localized, long-term impacts	Minor, adverse, localized, long-term impacts	

GUIDED DAY HIKING SERVICES (CULTURAL HISTORY/NATURAL HISTORY/RECREATIONAL)			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Threatened and Endangered Species	No additional effect. Continued minor, cumulative, adverse impacts.	No additional effect. Continued minor cumulative, adverse impacts.	
Natural Sound	No additional effect	No additional effect	
Air Quality	No effect	No effect	
Historic Resources	No effect	No effect	
Archeological and Ethnographic Resources	No effect	No effect	
Visual Resources	No additional effect	No additional effect	
Regional and Local Communities	No effect	Negligible, long-term, positive impacts	
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	
Visitor Use and Experience	No effect	Minor long-term, positive impacts	
Energy Consumption	No effect	No effect	
Landowners In and Adjacent to Park Boundaries	No effect	No effect	

TABLE 2-27 SUMMARY OF IMPACTS: GUIDED UNDERWATER DIVING TOURS

GUIDED UNDERWATER DIVING TOURS			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Water Quality	No effect	Negligible, adverse, long-term, localized impacts	
Floodplains	No effect	No effect	
Soils	No effect	No effect	
Vegetation	No effect	Negligible, adverse, site-specific, long-term impacts	
Wildlife, Including Aquatic Resources	No effect	Minor, adverse, localized, long-term impacts	
Threatened and Endangered Species	No effect	Minor, negative impacts and moderate, short-term, negative impacts	
Natural Sound	No effect	No effect	
Air Quality	No effect	No effect	
Historic Resources	No effect	No effect	
Archeological and Ethnographic Resources	No effect	No effect	
Visual Resources	No effect	No effect	
Regional and Local Communities	No effect	Negligible to minor, long-term, positive impacts	
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	Potential moderate, positive, long-term, regional impacts	
Visitor Use and Experience	No effect	Negligible to moderate, positive, long-term impacts	
Energy Consumption	No effect	No effect	
Landowners In and Adjacent to Park Boundaries	No effect	No effect	

TABLE 2-28 SUMMARY OF IMPACTS: GUIDED RAFTING

GUIDED RAFTING			
Impact	Alternative A - Status Quo/No Action		
Water Quality	No additional effect		
Floodplains	No effect		
Soils	No additional effect		
Vegetation	No additional effect		
Wildlife, Including Aquatic Resources	No additional effect		
Threatened and Endangered Species	No additional effect		
Natural Sound	No additional effect		
Air Quality	No effect		
Historic Resources	No effect		
Archeological and Ethnographic Resources	No effect		
Visual Resources	No additional effect		
Regional and Local Communities	No additional effect		
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No additional effect		
Visitor Use and Experience	No additional effect		
Energy Consumption	No additional effect		
Landowners In and Adjacent to Park Boundaries	No effect		

TABLE 2-29 SUMMARY OF IMPACTS: FIREWOOD SALES

FIREWOOD SALES			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Water Quality	No effect	No effect	
Floodplains	No effect	No effect	
Soils	No effect	Negligible, adverse, site-specific, long-term impacts if new facilities are constructed	
Vegetation	Continued minor, positive, site-specific, long-term impacts	Continued minor, positive, site-specific, long-term impacts	
Wildlife, Including Aquatic Resources	Continued negligible, positive, site-specific, long-term impacts	Negligible, positive, site-specific, long-term impacts	
Threatened and Endangered Species	Negligible long-term, positive impacts	Negligible, long-term, positive impact	
Natural Sound	No effect	No effect	
Air Quality	No additional effect	Minor, short-term, adverse impact	
Historic Resources	No effect	No effect	
Archeological and Ethnographic Resources	No effect	No effect	
Visual Resources	No effect	No effect	
Regional and Local Communities	No effect	Negligible, positive, long-term impacts	
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	
Visitor Use and Experience	No effect	Negligible, positive, long-term and minor, negative, short-term impacts	
Energy Consumption	No effect	No effect	
Landowners In and Adjacent to Park Boundaries	No effect	No effect	

TABLE 2-30 SUMMARY OF IMPACTS: PUBLIC SHOWERS

PUBLIC SHOWERS			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Water Quality	No effect	Negligible, adverse, site-specific, short-term if new facilities are constructed	
Floodplains	No effect	No effect	
Soils	No effect	Negligible, adverse, site-specific, short-term impact if new facilities are constructed	
Vegetation	No effect	Minor, adverse, site-specific, long-term impacts	
Wildlife, Including Aquatic Resources	No additional effect	No additional effect	
Threatened and Endangered Species	No additional effect	No additional effect	
Natural Sound	No effect	Minor, adverse, short-term, localized impacts during construction	
Air Quality	No effect	Negligible, adverse, short-term, localized impacts during construction	
Historic Resources	No effect	No effect	
Archeological and Ethnographic Resources	No effect	No effect	
Visual Resources	No effect	Negligible, adverse, short-term, site-specific impacts during construction	
Regional and Local Communities	No effect	Negligible, positive, short-term, regional impact	
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	
Visitor Use and Experience	No effect	Negligible to moderate, positive, long-term, site-specific impacts	
Energy Consumption	No effect	Negligible, short-term, increase during construction	
Landowners In and Adjacent to Park Boundaries	No effect	No effect	

TABLE 2-31 SUMMARY OF IMPACTS: BOAT TOURS AND TRANSPORTATION (BOAT TAXI)

BOAT TOURS AND TRANSPORTATION (BOAT TAXI)			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Water Quality	Continued negligible, adverse, localized, long-term impacts from turbidity; minor adverse impacts from point source pollution	Negligible, adverse, localized, long-term impacts	
Floodplains	No effect	No effect	
Soils	Continued negligible to minor, adverse, site-specific, long-term impacts	Minor, adverse, site-specific, long-term impacts	
Vegetation	No additional effect	No additional effect	
Wildlife, Including Aquatic Resources	Continued minor, adverse, localized, long-term impacts	Minor, adverse, localized, long-term impacts	
Threatened and Endangered Species	No additional effect	Long-term, positive impact from educational opportunities. Minor to moderate, localized, adverse effects from additional boats and docks.	

BOAT TOURS AND TRANSPORTATION (BOAT TAXI)			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Natural Sound	No additional effect	No additional effect	
Air Quality	Continued negligible, adverse, localized, long-term impacts	Negligible, adverse, localized, long-term impacts	
Historic Resources	No effect	No effect	
Archeological and Ethnographic Resources	No effect	No effect	
Visual Resources	No additional effect	No additional effect	
Regional and Local Communities	No effect	Negligible, long-term, positive impacts	
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	
Visitor Use and Experience	No effect	Negligible and minor, positive, long-term impacts	
Energy Consumption	No additional effect	Negligible, long-term increase	
Landowners In and Adjacent to Park Boundaries	No effect	No effect	

**TABLE 2-32 SUMMARY OF IMPACTS:
GUIDED INTERPRETIVE MOTOR VEHICLE TOURS AND PUBLIC TRANSPORTATION**

GUIDED INTERPRETIVE MOTOR VEHICLE TOURS AND PUBLIC TRANSPORTATION			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Water Quality	No effect	No effect	
Floodplains	No effect	No effect	
Soils	No effect	No effect	
Vegetation	Continued minor, positive, widespread, long-term impacts	Minor, positive, widespread, long-term impacts	
Wildlife, Including Aquatic Resources	No additional effect	No additional effect	
Threatened and Endangered Species	No additional effect	No additional effect	
Natural Sound	No additional effect	No additional effect	
Air Quality	Continued minor, positive, widespread, long-term impacts	Continued minor, positive, widespread, long-term impacts	
Historic Resources	No effect	No effect	
Archeological and Ethnographic Resources	No effect	No effect	
Visual Resources	No effect	No effect	
Regional and Local Communities	No effect	Negligible to minor, long-term, positive impacts	
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	Potential moderate, positive, long-term, regional impacts	
Visitor Use and Experience	No effect	Negligible to moderate, positive, long-term impacts	
Energy Consumption	No additional effect	Negligible, long-term decrease	
Landowners In and Adjacent to Park Boundaries	No effect	No effect	

TABLE 2-33 SUMMARY OF IMPACTS: HORSEBACK RIDING AND HORSE PACKING SERVICES

HORSEBACK RIDING AND HORSE PACKING SERVICES				
Impact	Alternative A – Status Quo/No Action (PREFERRED)	Alternative B	Alternative C	Alternative D
Water Quality	Continued minor to moderate, adverse, widespread, long-term impacts	Minor to moderate, adverse, widespread, long-term impacts	Minor to moderate, adverse, widespread, long-term impacts	Minor to moderate, adverse, localized, long-term impacts; minor, positive, widespread, long-term impact in the Lower McDonald Creek drainage
Floodplains	No effect	No effect	No effect	No effect
Soils	Continued minor, adverse, localized, long-term impacts from trail use; minor, adverse, site-specific, long-term impacts from soil contamination at stables	Continued minor, adverse, localized, long-term impacts from trail use; minor, adverse, site-specific, long-term impacts from soil contamination at stables	Continued minor, adverse, localized, long-term impacts from trail use; minor, adverse, site-specific, long-term impacts from soil contamination at stables	Continued minor, adverse, localized, long-term impacts from trail use; minor, positive, site-specific, long-term impacts at Lake McDonald stables; minor, adverse, site-specific, long-term impacts at Apgar stables
Vegetation	Continued moderate, negative, long-term localized impacts	Moderate, negative, long-term localized impacts	Moderate, negative, long-term localized impacts	Moderate, negative, long-term localized impacts and negligible to minor, positive, site-specific, long-term impacts
Wildlife, Including Aquatic Resources	Continued cumulative minor to moderate, adverse, localized, long-term impacts	Minor to moderate, adverse, localized, long-term impacts	Minor to moderate, adverse, localized, long-term impacts	Minor to moderate, adverse, localized, long-term impacts
Threatened and Endangered Species	Minor to moderate, adverse impacts	Continued cumulative adverse impacts; minor to moderate, positive long-term impacts at Apgar	Continued cumulative, minor to moderate, adverse impacts at Two Medicine and St. Mary	Continued cumulative, minor to moderate, positive long-term impacts at Lake McDonald; negligible, positive, long-term impact for the gray wolf
Natural Sound	Continued negligible, negative, localized, long-term impacts	Negligible, negative, localized, long-term impacts	Negligible, negative, localized, long-term impacts	Negligible, negative, localized, long-term impacts
Air Quality	No effect	Negligible, adverse, localized, long-term impacts	No effect	No effect
Historic Resources	No effect	No effect	No effect	No effect
Archeological and Ethnographic Resources	No effect	No effect	No effect	No effect
Visual Resources	No additional effect	No additional effect	No additional effect	No additional effect
Regional and Local Communities	No effect	No effect	Negligible, positive, long-term, regional impacts	Moderate, positive, short-term, regional impacts at the Apgar stables; minor, long-term, positive impacts
Blackfoot Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	Potential moderate, positive, long-term, regional impacts	No effect

HORSEBACK RIDING AND HORSE PACKING SERVICES				
Impact	Alternative A – Status Quo/No Action (PREFERRED)	Alternative B	Alternative C	Alternative D
Visitor Use and Experience	Negligible, positive, long-term and moderate, negative, short-term impacts	No effect	Moderate, positive, long-term impacts	Moderate, positive, long-term impacts
Energy Consumption	No effect	No effect	No effect	No effect
Landowners In and Adjacent to Park Boundaries	No effect	No effect	No effect	No effect

TABLE 2-34 SUMMARY OF IMPACTS: EMERGENCY ROAD SERVICES

EMERGENCY ROAD SERVICES			
Impact	Alternative A - Status Quo/No Action		
Water Quality	No additional effect		
Floodplains	No effect		
Soils	No additional effect		
Vegetation	No effect		
Wildlife, Including Aquatic Resources	No additional effect		
Threatened and Endangered Species	No additional effect		
Natural Sound	No additional effect		
Air Quality	No additional effect		
Historic Resources	No effect		
Archeological and Ethnographic Resources	No effect		
Visual Resources	No effect		
Regional and Local Communities	No additional effect		
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect		
Visitor Use and Experience	No additional effect		
Energy Consumption	No effect		
Landowners In and Adjacent to Park Boundaries	No effect		

TABLE 2-35 SUMMARY OF IMPACTS: GUIDED CROSS-COUNTRY SKIING AND SNOWSHOEING

GUIDED CROSS-COUNTRY SKIING AND SNOWSHOEING			
Impact	Alternative A - Status Quo/No Action		
Water Quality	No additional effect		
Floodplains	No effect		
Soils	No effect		
Vegetation	No additional effect		
Wildlife, Including Aquatic Resources	No additional effect		
Threatened and Endangered Species	No additional effect		
Natural Sound	No additional effect		
Air Quality	No effect		
Historic Resources	No effect		
Archeological and Ethnographic Resources	No effect		
Visual Resources	No additional effect		

GUIDED CROSS-COUNTRY SKIING AND SNOWSHOEING			
Impact	Alternative A - Status Quo/No Action		
Regional and Local Communities	No additional effect		
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect		
Visitor Use and Experience	No additional effect		
Energy Consumption	No effect		
Landowners In and Adjacent to Park Boundaries	No effect		

TABLE 2-36 SUMMARY OF IMPACTS: GUIDED BICYCLE TOURS

GUIDED BICYCLE TOURS			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Water Quality	No effect	No effect	
Floodplains	No effect	No effect	
Soils	No effect	No effect	
Vegetation	No effect	No effect	
Wildlife, Including Aquatic Resources	No additional effect	No additional effect	
Threatened and Endangered Species	No additional effect	No additional effect	
Natural Sound	No additional effect	No additional effect	
Air Quality	No effect	No effect	
Historic Resources	No effect	No effect	
Archeological and Ethnographic Resources	No effect	No effect	
Visual Resources	No effect	No effect	
Regional and Local Communities	Negligible, positive, long-term impact	Negligible, positive, long-term impact	
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	
Visitor Use and Experience	No effect	Negligible to minor, positive, long-term	
Energy Consumption	No effect	No effect	
Landowners In and Adjacent to Park Boundaries	No effect	No effect	

TABLE 2-37 SUMMARY OF IMPACTS: GUIDED PHOTOGRAPHY AND ART SEMINARS

GUIDED PHOTOGRAPHY AND ART SEMINARS			
Impact	Alternative A - Status Quo/No Action		
Water Quality	No additional effect		
Floodplains	No effect		
Soils	No additional effect		
Vegetation	No additional effect		
Wildlife, Including Aquatic Resources	No additional effect		
Threatened and Endangered Species	No additional effect		
Natural Sound	No additional effect		
Air Quality	No effect		
Historic Resources	No effect		
Archeological and Ethnographic Resources	No effect		
Visual Resources	No additional effect		

GUIDED PHOTOGRAPHY AND ART SEMINARS			
Impact	Alternative A - Status Quo/No Action		
Regional and Local Communities	No effect		
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No additional effect		
Visitor Use and Experience	No additional effect		
Energy Consumption	No effect		
Landowners In and Adjacent to Park Boundaries	No effect		

TABLE 2-38 SUMMARY OF IMPACTS: CATERED MEAL SERVICE

CATERED MEAL SERVICE			
Impact	Alternative A		
Water Quality	No additional effect		
Floodplains	No effect		
Soils	No additional effect		
Vegetation	No additional effect		
Wildlife, Including Aquatic Resources	No additional effect		
Threatened, Endangered and Sensitive Species	No additional effect		
Natural Sound	No additional effect		
Air Quality	No effect		
Historic Resources	No effect		
Archeological and Ethnographic Resources	No effect		
Visual Resources	No additional effect		
Regional and Local Communities	No effect		
Blackfeet and Salish-Kootenai Tribes	No effect		
Visitor Use and Experience	No additional effect		
Energy Consumption	No additional effect		
Landowners In and Adjacent to Park Boundaries	No effect		

TABLE 2-39 SUMMARY OF IMPACTS: COMMERCIAL STEP-ON GUIDE SERVICE

COMMERCIAL STEP-ON GUIDE SERVICE			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Water Quality	No effect	No effect	
Floodplains	No effect	No effect	
Soils	No effect	No effect	
Vegetation	No effect	No effect	
Wildlife, Including Aquatic Resources	No effect	No effect	
Threatened and Endangered Species	No effect	No effect	
Natural Sound	No effect	No effect	
Air Quality	No effect	No effect	
Historic Resources	No effect	No effect	
Archeological and Ethnographic Resources	No effect	No effect	
Visual Resources	No effect	No effect	
Regional and Local Communities	No effect	Negligible to minor, positive, long-term, regional impacts	

COMMERCIAL STEP-ON GUIDE SERVICE			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	Potential moderate, positive, long-term, regional impacts	
Visitor Use and Experience	No effect	Minor, positive, long-term impacts	
Energy Consumption	No effect	No effect	
Landowners In and Adjacent to Park Boundaries	No effect	No effect	

TABLE 2-40 SUMMARY OF IMPACTS: GUIDED MOTORCYCLE TOURS

GUIDED MOTORCYCLE TOURS			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Water Quality	No effect	No effect	
Floodplains	No effect	No effect	
Soils	No effect	No effect	
Vegetation	No effect	No effect	
Wildlife, Including Aquatic Resources	No additional effect	No additional effect	
Threatened and Endangered Species	No additional effect	No additional effect	
Natural Sound	No additional effect	No additional effect	
Air Quality	No effect	No effect	
Historic Resources	No effect	No effect	
Archeological and Ethnographic Resources	No effect	No effect	
Visual Resources	No effect	No effect	
Regional and Local Communities	No effect	No effect	
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	
Visitor Use and Experience	No effect	Minor, negative, long-term	
Energy Consumption	No effect	No effect	
Landowners In and Adjacent to Park Boundaries	No effect	No effect	

TABLE 2-41 SUMMARY OF IMPACTS: APGAR VILLAGE DEVELOPED AREA

APGAR VILLAGE			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
Water Quality	Minor to negligible, adverse, localized, long-term impacts	Minor, adverse, localized, long-term impacts	Minor, adverse, localized, long-term impacts and minor, positive, localized, long-term impacts
Floodplains	Negligible, site-specific, long-term, positive impacts	Negligible, site-specific, long-term, positive impacts	Negligible, site-specific, long-term, positive impacts
Soils	Minor, positive, site-specific, long-term impact	Minor, positive, site-specific, long-term impacts; negligible and minor, adverse, site-specific, long-term impacts	Minor, positive, site-specific, long-term impacts; minor, adverse, site-specific, long-term impacts
Vegetation	Negligible to minor, adverse, site-specific, long-term impacts	Minor, adverse, site-specific, long-term impacts and minor-positive, site-specific, long-term impacts	Minor and moderate, adverse, site-specific, long-term impacts and minor, positive, site-specific, long-term impacts

APGAR VILLAGE			
Impact	Alternative A- Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
Wildlife, Including Aquatic Resources	Minor, adverse, localized, short-term impacts	Moderate, positive, site-specific, long-term impacts and minor, adverse, localized, long-term impacts. Minor to moderate, negative, long-term impacts	Moderate, positive, site-specific, long-term impacts; minor, adverse, localized, long-term impacts. Minor to moderate, negative, long-term impacts
Threatened and Endangered Species	Negligible to minor short-term, adverse impacts; and negligible to minor long-term impacts	Negligible to minor, short term impacts, moderate adverse impacts and negligible to minor, short-term and long-term, adverse impacts	Negligible to minor, short term impacts and moderate adverse impacts and negligible to minor, short-term, adverse impacts; minor, long-term impact
Natural Sound	Minor, adverse, short-term, localized impact	Minor, adverse, short-term and long-term, localized impact	Minor, adverse, short-term and long-term, localized impact
Air Quality	Negligible, adverse, short-term, localized impacts	Negligible, adverse, long-term, localized impacts	Negligible, adverse, long-term, localized impacts
Historic Resources	No effect	No effect	No effect
Archeological and Ethnographic Resources	No effect	No effect	No effect
Visual Resources	Minor, adverse, short-term, site-specific impacts	Moderate, positive, site-specific, long-term impacts	Major, positive, site-specific, long-term impacts
Regional and Local Communities	Negligible positive, short-term, impact	Negligible, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; negligible to minor, long-term, positive impacts	Moderate, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; negligible to minor, long-term, positive impacts
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	No effect
Visitor Use and Experience	Negligible, short-term, negative impacts from construction; minor long-term, positive impacts	Moderate and negligible, long-term, positive and moderate, negative, long-term impacts on visitor experience; local, short-term, negative impact from construction	Major long-term, positive impact on overall visitor experience; major long-term, negative impact on some visitors
Energy Consumption	Negligible, short-term increase in parkwide energy consumption	Negligible, long-term increase in parkwide energy consumption	Negligible, long-term increase in parkwide energy consumption
Landowners In and Adjacent to Park Boundaries	Minor, adverse, short-term, site-specific impacts	Minor, adverse, long-term site-specific impacts	Minor, adverse, long-term site-specific impacts and major, positive, long-term impacts on landowners of the property behind the existing Village Inn

TABLE 2-42 SUMMARY OF IMPACTS: LAKE McDONALD DEVELOPED AREA

LAKE McDONALD			
Impact	Alternative A- Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
Water Quality	Minor to negligible, adverse, localized, long-term impacts	Minor, adverse, localized, long-term impacts	Minor, adverse, localized, long-term impacts
Floodplains	No effect	Negligible, localized, long-term, positive impacts	Negligible, localized, long-term, positive impacts
Soils	Negligible, adverse, site-specific, short-term impact	Minor, positive, site-specific, long-term impacts and minor, adverse, site-	Minor, positive, site-specific, long-term impacts and minor, adverse, site-

LAKE MCDONALD			
Impact	Alternative A- Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
		specific, long-term impacts	specific, long-term impacts
Vegetation	Negligible to minor, adverse, site-specific, long-term impacts	Minor, adverse, site-specific, long-term impacts	Minor, adverse, site-specific, long-term impacts
Wildlife, Including Aquatic Resources	Minor, adverse, localized, short-term impacts	Minor and minor to moderate, adverse, localized, long-term impacts	Minor and minor to moderate, adverse, localized, long-term impacts
Threatened and Endangered Species	Minor short-term, adverse impacts and minor long-term, adverse impact	Minor, short-term adverse impacts; negligible long-term, positive impact; minor long-term adverse impacts; minor and minor to moderate adverse short-term and long-term impacts	Minor, short-term adverse impacts; negligible long-term, positive impact; minor long-term adverse impacts; minor and minor to moderate adverse short-term and long-term impacts
Natural Sound	Minor, adverse, short-term, localized impact	Minor, adverse, short-term and long-term, localized impact	Minor, adverse, short-term and long-term, localized impact
Air Quality	Negligible, adverse, short-term, localized impacts	Negligible, adverse, long-term, localized impacts	Negligible, adverse, long-term, localized impacts
Historic Resources	Moderate to major, positive, long-term, site-specific impacts	Moderate to major, positive, long-term, site-specific impacts on historic buildings and potential moderate to major, adverse, site-specific, long-term impacts on historic district	Moderate to major, positive, long-term, site-specific impacts on historic buildings and potential moderate to major, adverse, site-specific, long-term impacts on historic district
Archeological and Ethnographic Resources	Moderate to major, long-term, site-specific positive impacts	Moderate to major, long-term, site-specific positive impacts; moderate long-term, site-specific, adverse impacts.	Moderate to major, long-term, site-specific positive impacts; moderate long-term, site-specific, adverse impacts
Visual Resources	Minor, adverse, short-term, site-specific impacts	Moderate, positive, site-specific, long-term, adverse impacts and moderate, adverse, site-specific, long-term impacts	Major, positive, site-specific, long-term impacts and moderate, adverse, site-specific, long-term impacts
Regional and Local Communities	Minor positive, short-term, impact	Minor, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; minor and negligible to minor, long-term, positive impacts	Minor, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; minor and negligible to minor, long-term, positive impacts
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	No effect
Visitor Use and Experience	Negligible short-term, negative impacts from construction; moderate long-term, positive impacts	Negligible short-term, negative impacts from construction; major long-term, positive impact; negligible, negative impact from reduction in rooms	Negligible short-term, negative impacts from construction; major long-term, positive impact by separating employee/guest areas
Energy Consumption	Negligible, short-term increase in parkwide energy consumption	Negligible, long-term increase in parkwide energy consumption	Negligible, long-term increase in parkwide energy consumption
Landowners In and Adjacent to Park Boundaries	Minor, adverse, short-term, site-specific impacts	Minor, adverse, short-term, site-specific impacts	Minor, adverse, short-term, site-specific impacts

TABLE 2-43 SUMMARY OF IMPACTS: RISING SUN DEVELOPED AREA

RISING SUN			
Impact	Alternative A- Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
Water Quality	Minor to negligible, adverse, localized, long-term impacts	Negligible, adverse, localized, long-term impacts	Negligible, adverse, localized, long-term and minor, positive, localized, long-term impacts
Floodplains	Moderate, localized, long-term, adverse impact	Moderate, localized, long-term, adverse impact	Moderate, localized, long-term, adverse impact
Soils	Negligible, adverse, site-specific, short-term impact	Negligible and minor, adverse, site-specific, long-term impacts and minor, positive, site-specific, long-term impacts	Negligible and minor, adverse, site-specific, long-term impacts and minor, positive, site-specific, long-term impacts
Vegetation	Negligible to minor, adverse, site-specific, long-term impacts	Minor, adverse, site-specific, long-term impacts	Minor, adverse, site-specific, long-term impacts
Wildlife, Including Aquatic Resources	Minor, adverse, localized, short-term impacts	Minor to moderate, adverse, localized, long-term impacts	Minor to moderate, adverse, localized, long-term impacts
Threatened and Endangered Species	Minor short-term, adverse impacts	Minor short-term, adverse impacts and minor to moderate, long-term, localized, adverse impacts; negligible short-term adverse impacts; minor to moderate, adverse, short-term impacts during spring or fall; moderate short-term, adverse impacts in winter	Minor short-term, adverse impacts, minor to moderate long-term, localized, adverse impacts and negligible, short-term, adverse impacts in summer; minor to moderate adverse, short-term impacts in spring or fall; moderate short-term impacts in winter
Natural Sound	Minor, adverse, short-term, localized impact	Minor, adverse, short-term and long-term, localized impact	Minor, adverse, short-term and long-term, localized impact
Air Quality	Negligible, adverse, short-term, localized impacts	Negligible, adverse, long-term, localized impacts	Negligible, adverse, long-term, localized impacts
Historic Resources	Moderate to major, positive, long-term, site-specific impacts	Moderate to major, positive, long-term, site-specific impacts	Moderate to major, positive, long-term, site-specific impacts
Archeological and Ethnographic Resources	Negligible to minor, long-term, positive, site-specific	Negligible to minor, long-term, positive, site-specific	Negligible to minor, long-term, positive, site-specific
Visual Resources	Minor, adverse, short-term, site-specific impacts	Moderate, adverse, site-specific, long-term impacts	Moderate, adverse, site-specific, long-term impacts
Regional and Local Communities	Negligible positive, short-term, impact	Minor, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; negligible to minor, long-term, positive impacts	Minor, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; negligible to minor, long-term, positive impacts
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	No effect
Visitor Use and Experience	Negligible short-term, negative impacts from construction; negligible long-term, positive impacts from improvements	Negligible short-term, negative impacts from construction; minor long-term, positive impacts; moderate long-term, positive impact	Negligible short-term, negative impacts from construction; minor long-term, positive impacts; moderate long-term, positive impact
Energy Consumption	Negligible, short-term increase in parkwide energy consumption	Negligible, long-term increase in parkwide energy consumption	Negligible, long-term increase in parkwide energy consumption
Landowners In and Adjacent to Park Boundaries	No effect	No effect	No effect

TABLE 2-44 SUMMARY OF IMPACTS: TWO MEDICINE DEVELOPED AREA

TWO MEDICINE			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	
Water Quality	Minor to negligible, adverse, localized, short-term impacts	Minor, adverse, localized, long-term impacts	
Floodplains	Moderate, localized, long-term	Moderate, localized, long-term	
Soils	Negligible, adverse, site-specific, short-term impact	Negligible long-term, site-specific adverse impact from ground disturbance; minor, positive, site-specific, long-term impact from soil restoration	
Vegetation	Negligible to minor, adverse, site-specific, long-term impacts	Negligible and minor, adverse, site-specific, long-term impacts and minor-positive, site-specific, long-term impacts	
Wildlife, Including Aquatic Resources	Minor, adverse, localized, short-term impacts	Minor, adverse, localized, long-term impacts; negligible, negative, long-term impacts	
Threatened and Endangered Species	Minor to negligible, short-term, localized, adverse impacts	Minor to negligible and negligible, short-term and long-term, localized adverse impacts	
Natural Sound	Minor, adverse, short-term, localized impact	Minor, adverse, short-term, localized impact; negligible, negative, long-term impacts	
Air Quality	Negligible, adverse, short-term, localized impacts	Negligible, adverse, short-term, localized impacts	
Historic Resources	Moderate, positive, long-term, site-specific impacts	Moderate to major, positive, long-term, site-specific impacts	
Archeological and Ethnographic Resources	Minor, long-term, positive	Minor, long-term, positive	
Visual Resources	Negligible to minor, adverse, short-term, site-specific impacts	Moderate, positive, site-specific, long-term impacts	
Regional and Local Communities	Negligible positive, short-term, impact	Negligible, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; negligible to minor, long-term, positive impacts	
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	
Visitor Use and Experience	Negligible short-term, negative impacts from construction; negligible long-term, positive impacts	Negligible short-term, negative impacts from construction; moderate mid-term, negative impacts; minor to major long-term, positive impacts	
Energy Consumption	Negligible, short-term increase in parkwide energy consumption	Negligible, short-term increase in parkwide energy consumption	
Landowners In and Adjacent to Park Boundaries	No effect	No effect	

TABLE 2-45 SUMMARY OF IMPACTS: MANY GLACIER DEVELOPED AREA

MANY GLACIER			
Impact	Alternative A - Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
Water Quality	Negligible to minor, adverse, localized, long-term impact	Minor, adverse, localized, long-term impact	Minor, adverse, localized, long-term impact
Floodplains	No effect	No effect	No effect
Soils	Negligible, adverse, site-specific, short-term impact	Negligible to minor, adverse, site-specific, long-term impact	Negligible and minor, adverse, site-specific, long-term impact
Vegetation	Negligible to minor, adverse, site-specific, long-term impacts	Negligible and minor, adverse, site-specific, long-term impacts and minor, positive, site-specific, long-term impacts	Negligible and minor, adverse, site-specific, long-term impacts and minor, positive, site-specific, long-term impacts
Wildlife, Including Aquatic Resources	Minor, adverse, localized, long-term impacts	Minor to moderate, adverse, localized, long-term impacts	Minor to moderate, adverse, localized, long-term impacts
Threatened and Endangered Species	Minor long-term, localized, adverse impacts on some species; minor to negligible, short-term, adverse impacts	Minor long-term, localized, adverse impacts on some species. During construction, minor to negligible, short-term, adverse impacts; negligible short-term, adverse impacts in summer; minor to moderate short-term, adverse impacts in spring and fall; moderate to major short-term, adverse impacts in winter; negative, minor to moderate, long-term	Minor long-term, localized, adverse impacts on some species. During construction, minor to negligible, short-term, adverse impacts; negligible short-term, adverse impacts in summer; minor to moderate short-term, adverse impacts in spring and fall; moderate to major short-term, adverse impacts in winter; negative, minor to moderate, long-term
Natural Sound	Minor, adverse, short-term, localized impact	Minor, adverse, short-and long-term, localized impact	Minor, adverse, short and long-term, localized impact
Air Quality	Negligible, adverse, short-term, localized impacts	Negligible, adverse, short-term, localized impacts	Negligible, adverse, short-term, localized impacts
Historic Resources	Moderate to major, positive, long-term, site-specific impacts	Moderate to major, positive, long-term, site-specific impacts	Moderate to major, positive, long-term, site-specific impacts on historic buildings and potential, minor, adverse, site-specific, long-term impacts on historic district
Archeological and Ethnographic Resources	Positive and negative impacts	Negligible to minor, adverse and minor, positive, long-term impacts	Minor, adverse, long-term impacts
Visual Resources	Minor, adverse, short-term, site-specific impacts	Moderate, positive, site-specific, long-term impacts and minor, adverse, site-specific, long-term impacts	Moderate, positive, site-specific, long-term impacts and moderate, adverse, site-specific, long-term impacts
Regional and Local Communities	Minor positive, short-term, impact	Minor, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; negligible to minor, long-term, positive impacts	Minor, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; negligible to minor, long-term, positive impacts
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	No effect
Visitor Use and Experience	Localized, minor to moderate, adverse impacts during construction; major long-term, positive impact	Moderate, negative long-term impacts on wildlife and moderate, positive, long-term impacts	Major, long-term, positive impacts on visitors; negative, moderate, long-term impacts on wildlife

MANY GLACIER			
Impact	Alternative A - Status Quo/No Action	Alternative B	Alternative C (PREFERRED)
Energy Consumption	Negligible, short-term increase in parkwide energy consumption	Negligible, short-term increase in parkwide energy consumption	Negligible, long-term increase in parkwide energy consumption
Landowners In and Adjacent to Park Boundaries	No effect	No effect	No effect

TABLE 2-46 SUMMARY OF IMPACTS: SWIFTCURRENT DEVELOPED AREA

SWIFTCURRENT			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
Water Quality	Minor to negligible, adverse, localized, long-term impacts	Minor to negligible, adverse, localized, long-term impacts	Minor to negligible, adverse, localized, long-term impacts
Floodplains	No effect	No effect	No effect
Soils	Negligible, adverse, site-specific, short-term impact	Minor, adverse, site-specific, long-term impact	Minor, adverse, site-specific, long-term impact
Vegetation	Negligible to minor, adverse, site-specific, long-term impacts	Minor to moderate, adverse, site-specific, long-term impacts	Minor to moderate, adverse, site-specific, long-term impacts
Wildlife, Including Aquatic Resources	Minor to negligible, adverse, localized, short-term impacts	Minor to moderate, adverse, localized, long-term impacts	Minor to moderate, adverse, localized, long-term impacts
Threatened and Endangered Species	Minor short-term, adverse impacts	Minor short-term, adverse impacts; negligible short-term, adverse impacts in summer; minor to moderate short-term, adverse impacts in spring/fall; moderate to major short-term, adverse impacts in winter; negligible to minor, localized impacts; negative, minor to moderate, long-term	Minor short-term, adverse impacts; negligible short-term, adverse impacts in summer; minor to moderate short-term, adverse impacts in spring/fall; moderate to major short-term, adverse impacts in winter; negative, minor to moderate, long-term
Natural Sound	Minor, adverse, short-term, localized impact	Minor, adverse, short-term and long-term, localized impact	Minor, adverse, short-term and long-term, localized impact
Air Quality	Negligible, adverse, short-term, localized impacts	Negligible, adverse, long-term, localized impacts	Negligible, adverse, long-term, localized impacts
Historic Resources	Moderate to major, positive, long-term, site-specific impacts	Moderate to major, positive, long-term, site-specific impacts on historic buildings and potential minor to moderate, adverse, site-specific, long-term impacts on historic district	Moderate to major, positive, long-term, site-specific impacts on historic buildings and potential minor to moderate, adverse, site-specific, long-term impacts on historic district
Archeological and Ethnographic Resources	Negligible to minor, positive, site-specific, long-term	Negligible to minor, positive, site-specific, long-term	Negligible to minor, positive, site-specific, long-term
Visual Resources	Minor, adverse, short-term, site-specific impacts	Moderate, adverse, site-specific, long-term impacts	Moderate, adverse, site-specific, long-term impacts
Regional and Local Communities	Negligible positive, short-term, impact	Minor, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; negligible to minor, long-term, positive impacts	Minor, positive, short-term, regional impact; negligible to minor, adverse, short-term, regional impact; negligible to minor, long-term, positive impacts
Blackfeet Tribe and Confederated Salish and Kootenai Tribes	No effect	No effect	No effect

SWIFTCURRENT			
Impact	Alternative A - Status Quo/No Action	Alternative B (PREFERRED)	Alternative C
Visitor Use and Experience	Negligible short-term, negative impacts during construction; minor long-term, positive impacts from overall improvements	Moderate, negative and positive, long-term impacts	Minor, positive, long-term impacts
Energy Consumption	Negligible, short-term increase in parkwide energy consumption	Negligible, long-term increase in parkwide energy consumption	Negligible, long-term increase in parkwide energy consumption
Landowners In and Adjacent to Park Boundaries	No effect	No effect	No effect

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Chapter 3 Affected Environment





Chapter 3 Affected Environment

INTRODUCTION

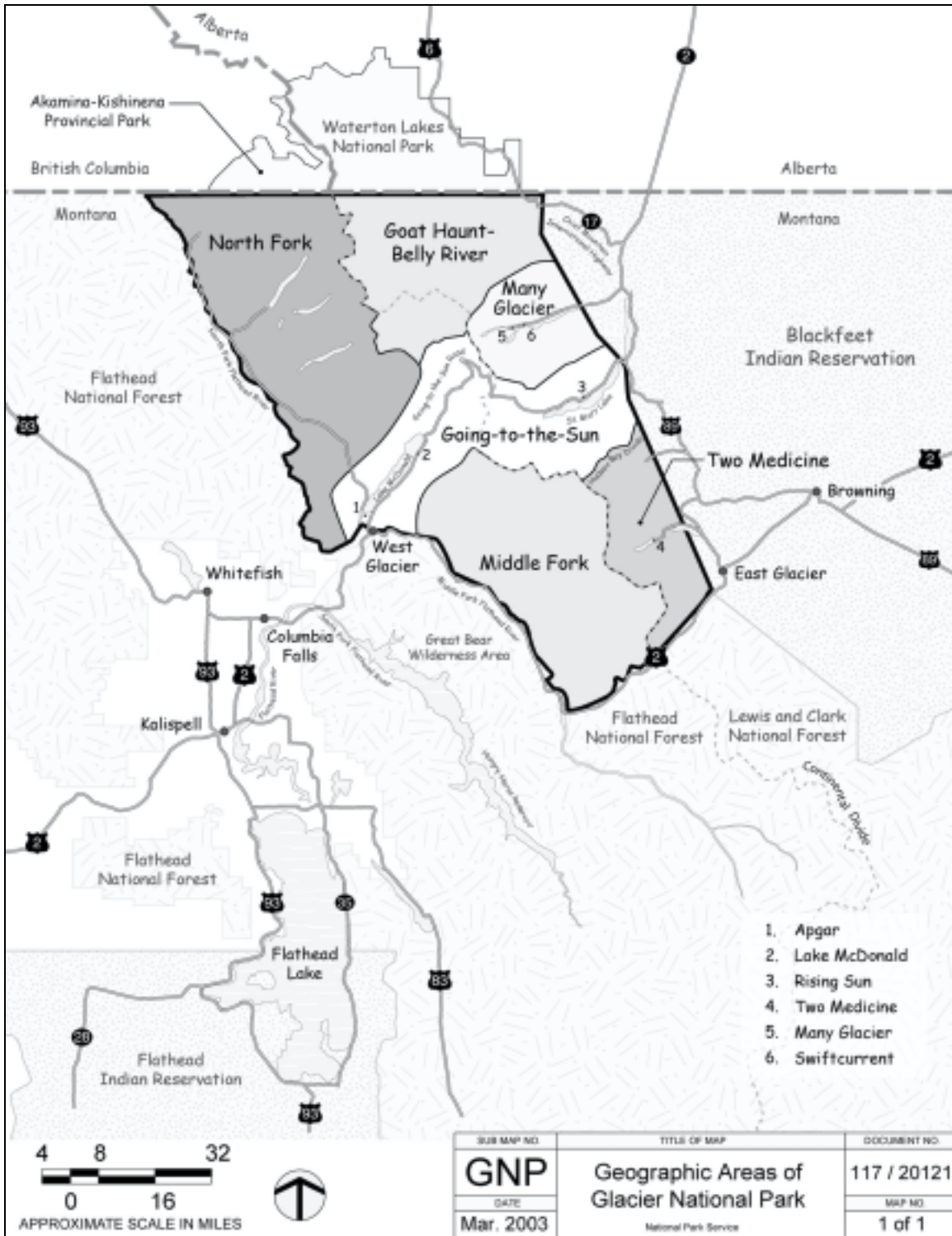
This chapter describes the existing environment that could be affected by implementing actions proposed by the alternatives. Natural, cultural and socioeconomic resources are discussed.

REGIONAL LOCATION AND SETTING

Glacier National Park is located in the state of Montana in the Rocky Mountains and bounded to the north by the Canadian provinces of Alberta and British Columbia. The North and Middle Forks of the Flathead River border the park on the west and south, and the Continental Divide bisects the park. The western entrance to the park is 33 miles from Kalispell on U.S. Highway 2, 20 miles from Columbia Falls and 27 miles from Whitefish. The east side of the park is near Browning, on the Blackfeet Indian Reservation, 32 miles from the St. Mary entrance. The Two Medicine area entrance is 12 miles from East Glacier. (See Chapter 1, Map 1-1. Vicinity of Glacier National Park.)

The park is at the apex, or triple divide, of three oceans: the Arctic, Atlantic and Pacific. It includes 1,013,572 acres of breathtaking mountain scenery. Its jagged peaks and crystalline lakes are remnants of extensive glaciation in the last ice age, and nearly 40 glaciers still remain in the park. The park is the relatively undisturbed core of a large ecosystem that supports a large variety of plants and animals.

It is surrounded mostly by publicly owned and Reservation land. Much of the land to the south and west of the park is in the Flathead National Forest. The southeast corner of the park borders a portion of the Lewis and Clark National Forest known as the Badger-Two Medicine area. The 1.5 million-acre Blackfeet Reservation is located along the park's eastern boundary. Waterton Lakes National Park, Alberta, is north and east of the Continental Divide, and land managed by the province of British Columbia is north and west of the Continental Divide. Except for the Akamina-Kishinena Provincial Park, which is at the junction of Montana, Alberta and British Columbia, the British Columbian land that borders the park is managed for multiple uses or multiple uses with emphasis on special resource values.



MAP 3-1 GEOGRAPHIC AREAS OF GLACIER NATIONAL PARK

There are narrow strips of privately owned land in the North Fork and Middle Fork River Valleys along the park boundaries. U.S. Highway 2 and the Burlington Northern-Santa Fe Railway follow the park's southern boundary.

Kalispell is the largest city in both the Glacier National Park area and northwestern Montana. It is approximately 33 miles southwest of the park's entrance at West Glacier on U.S. Highway 2.

The Rocky Mountains cover more than 1,800 square miles of the park. The Livingston Range to the west and the Lewis Range to the east extend from northwest to southeast through the park, with the Continental Divide following the crest of the Lewis Range. Elevation ranges from a low of 3,150 feet at the junction of the Middle and North Forks of the Flathead River to a high of 10,466 feet on Mt. Cleveland. The park has six peaks over 10,000 feet and 32 peaks over 9,100 feet.

National and state forest lands near the park have mountains with moderate to steep slopes and narrow valleys. Several peaks on national forest land near the park exceed 8,000 feet in elevation, and most of the vegetative cover is dense coniferous forest. Most of the Blackfoot Indian Reservation has gently sloping plains with deep stream channels. There are both coniferous forest and aspen parklands where the reservation and the park join. Waterton Lake and the broad Waterton Valley are the center of Waterton Lakes National Park, and the adjacent slopes are very steep. A large part of Waterton Lakes National Park is the convergence of prairie and mountain ecosystems.

Glacier-Waterton International Peace Park is part of the Crown of the Continent Ecosystem, which also includes the wilderness areas of British Columbia and Alberta adjacent to the park, portions of the Blackfoot Indian Reservation, the Bob Marshall-Great Bear-Scapegoat Wilderness complex and adjacent U.S. Forest Service (USFS) lands. The entire area is a large ecosystem of interconnected plant and wildlife populations. Some wildlife move seasonally throughout the ecosystem beyond the boundaries of the park. The park is one of the few places in the world where all the native predators existing at the time of the park's establishment and most of their historic prey continue to survive in the wild.

National and state forest lands in the region produce timber products and provide many outdoor recreational opportunities, including world-class hunting and fishing. The mountains bordering the park are a source of water for millions of people living in the Missouri, Saskatchewan and Columbia River watersheds. Privately owned land in the North Fork and Middle Fork River Valleys is used for homesites, tourism-oriented businesses and timber production. The Blackfoot Indian Reservation is used for grazing and other agricultural needs. Along the park boundary, tribal land is also managed for timber. The reservation has a few small oil and gas fields as well as ongoing mineral exploration. The Flathead Valley south of the park is an area that is dominated by agricultural production and small, rapidly growing communities. Flathead Lake in the northern portion of the Flathead Valley is the largest freshwater lake west of the Mississippi River and a very important recreational resource.

Diverse recreational opportunities and experiences are available in Glacier National Park. Visitors can drive the famous Going-to-the-Sun Road in their own vehicles. They can stay in the park's grand historic lodging facilities or choose from a variety of campgrounds and motor inns. Other activities, such as snowshoeing, cross-country skiing, horseback riding, canoeing, fishing, or commercial boat or vehicle tours are also available. Visitors can hike on approximately 747 miles of trails throughout the park, where primitive campsites are available.

NATURAL RESOURCES

WATER QUALITY

Water quality in Glacier National Park is considered to be very good. The water use classification for the streams in the park is A-1 (Montana Water Quality Act ARM 17.30.608). This classification is for high quality water suitable for drinking and culinary food processing following conventional treatment, as well as bathing, swimming, and recreation. It is also suitable for growth and propagation of salmonid fishes and aquatic life, waterfowl, furbearers, and agricultural and industrial water supplies (Montana Water Quality Act ARM 17.30.622).

Between 1984 and 1990, the Park Service and the Flathead Lake Biological Station conducted a monitoring program to establish a baseline for water quality in the park (Ellis et al. 1990). Throughout the six geographic areas, five large frontcountry lakes near developed areas with development along the lakeshore and heavy use by park visitors were monitored. Also, eight backcountry lakes in remote alpine headwaters were monitored. The study included the chemical, physical and biological sampling of each lake. Lake McDonald, and St. Mary, Two Medicine, and Swiftcurrent Lakes were part of the study.



USNPS Photo

The Apgar Village and Lake McDonald developed areas are in the Lower McDonald Creek watershed. The Apgar Village developed area is at the foot of Lake McDonald, and the Lake McDonald developed area is on its northeast shore. The monitoring program determined that Lake McDonald has extremely good water quality with no measurable pollutants and few dissolved solids (Ellis et al. 1990). Since the lake is very low in nutrients and productivity because of low phosphorus, it would be extremely sensitive to phosphorus loading. The lake is also low in dissolved solids. A 1987-1988 water quality study of Lake McDonald detected increased fluorescence readings in specific areas along the lake's shoreline, indicating possible septic leachate entering the lake.

The Rising Sun developed area is on the northwest side of St. Mary Lake, in the St. Mary drainage. It is immediately adjacent to Rose Creek, which flows into the lake. The results of the monitoring program indicated that water quality in St. Mary Lake is extremely good, and no measurable pollutants were detected (Ellis et al. 1990). The lake, which contains few dissolved solids and is also very low in nutrients and productivity, would be sensitive to phosphorus loading.

The Two Medicine developed area is located near the foot of Two Medicine Lake. The monitoring program (Ellis et al. 1990) determined that the lake has extremely good water quality with no measurable pollutants. Two Medicine Lake contains few dissolved solids because of the low dissolution rates of the underlying bedrock. It has very little buffer capacity and is extremely sensitive to acidic deposition. It is very low in nutrients and productivity because of low phosphorus and would be extremely sensitive to phosphorous loading.

The Many Glacier and Swiftcurrent developed areas are located in the Swiftcurrent Creek drainage. The Many Glacier developed area is located on the east shore of Swiftcurrent Lake near its outlet. The Swiftcurrent developed area is located north of Swiftcurrent Creek, which flows into Swiftcurrent Lake. Results of the monitoring program (Ellis et al. 1990) indicated that water quality in Swiftcurrent Lake is extremely good. Swiftcurrent Lake contains few dissolved solids, is low in nutrients and productivity, and would be sensitive to phosphorus loading.

FLOODPLAINS

Floodplains form along the banks of mid-sized streams and larger rivers. They are low-lying areas where heavy water flows are caused by streams and rivers spilling over and flooding the land. This flooding usually occurs in early spring when the snow melts or when an unusually large amount of rainfall is concentrated locally in a few hours or days. Mountain rains that fall a number of miles away also can cause flooding, where water cascades down small mountain creeks and gathers at larger streams and rivers.

A contractor conducted floodplain literature reviews (Land & Water Consulting, Inc. 2002) for the six developed areas during the fall of 2001 to determine where floodplains are known to occur and to what extent they would occur in the six developed areas (Apgar Village, Lake McDonald, Rising Sun, Two Medicine, Many Glacier, and Swiftcurrent). All of these areas are adjacent to streams or lakes, and existing facilities may be located in the 100-year floodplain. The literature review determined that little credible information exists on floodplains in each of these areas. Floodplain surveys were conducted of the six developed areas in July 2002 by the National Park Service Water Resources Division (NPS 2002b). Much of the information below is from this most recent report.

Going-to-the-Sun Road Corridor Area

The Apgar Village developed area is bordered by Lake McDonald to the north and Lower McDonald Creek to the west. Lake McDonald is emptied by Lower McDonald Creek, which in turn empties into the Middle Fork of the Flathead River. The U.S. Department of Interior has included Lower McDonald Creek in the 100- and 500-year floodplains. The entire Apgar development area is outside the 100-year floodplain and may be within the 500-year floodplain.

The Lake McDonald developed area is on the west shore of Lake McDonald, and Snyder Creek flows through the development. Snyder Creek is a very dynamic stream in this area. Documentation from the U.S. Army Corps of Engineers indicates that the slope of Snyder Creek through the developed area averages 5 to 6%, which is a supercritical flow. This type of flow can move yards of rock and other debris, causing the relocation of the creek channel. If the historic Lower Snyder Creek bridge, located in the developed area, becomes clogged with debris, the floodwaters would extend over a very large area.

Snyder Creek drains an approximately 6.4-square-mile drainage area. The creek passes under three bridges in the subject reach, under the Going-to-the-Sun Highway, under an access road just upstream from the lodge, and under a pedestrian bridge just upstream from confluence with Lake McDonald. The reach from just upstream of the Going-to-the-Sun bridge down to just above the pedestrian bridge (including the access road bridge) was surveyed and simulated using a computer model. It was found that this bridge can pass up to about a 30-year flood (1,800 cfs) if the bridge opening is unobstructed by debris. The lower bridge can only pass up to about a 15-year flood (1,100 cfs). Should woody debris collect in the bridge openings, less capacity would be realized. Sediment deposits do not seem to be a large issue in this reach of Snyder Creek. Should the lower bridge become obstructed, the

likelihood of flooding in the developed area increases. The buildup on the left bank of Snyder Creek in the developed area is within the 100-year floodplain. The lodge is outside the floodplain as long as the lower bridge does not become blocked.

The Rising Sun developed area is located to the north of St. Mary Lake and the Going-to-the-Sun Road. Rose Creek flows through the developed area. Two areas have the potential for floodplains: a 100-year floodplain potentially occurs south of the Going-to-the-Sun Road where the road acts as a barrier. The second area is north of the road where Rose Creek flows through the developed area. This creek can be overloaded, and the flood boundaries are difficult to predict (NPS 2002b). The area where the General Store/Motel/Dormitory at Rising Sun is located is within a less-than-100-year floodplain. The Power House Dormitory is at immediate risk from flooding due to likely failure of the adjacent embankment during a large flood event. Flooding in the Rising Sun developed area could occur more frequently than previously thought.

Two Medicine Area

The Two Medicine developed area is located along the west shore of Two Medicine Lake with Appistoki Creek running through it. The National Park Service computed the 100-year interval flow rate using a model of Appistoki Creek, and several cross sections were surveyed across the creek to help determine potential risks to the present and proposed structures in the developed areas. Some evidence suggests that the area is subject to delta flooding.

Appistoki Creek drains an area of approximately 2.6 square miles and flows along the access road and near the historic Two Medicine General Store just before entering Two Medicine Lake. No gaging record is available for the creek. Inspection of the local U.S. Geological Survey quadrangle (Squaw Mountain, MT) indicates that as of the date of the map, 1995, Appistoki Creek followed a more southerly alignment, flowing to the south of the store. Presently, the creek flows under a bridge upstream of the store area and enters the lake north of the store. It appears that the channel has been realigned by excavation to its present alignment. The channel is unnaturally straight and has obviously been manipulated with heavy equipment in the past. Following a flooding episode in the past, the channel was intentionally realigned to be less threatening to the General Store/Boat House area downstream.

The Appistoki Creek bridge is capable of passing a 25-year flood before being overtopped. If the bridge is overtopped, it is assumed that flow would travel down the existing creek alignment and not threaten the historic store area or the ranger station. However, flood risk should still be considered a factor in this area. The newly (in geologic terms) constructed channel is not fully adjusted to its setting as evidenced by erosion and deposition processes that are present. It is likely that at some time during a large flood, the channel will try to reclaim its former alignment and could threaten the store area. The possibility of sediment and woody debris accumulation at and upstream of the bridges could cause more widespread flooding than predicted by our model, and failure of the bridge at lower flows than predicted. The source of sediment and wood is the active erosion of the channel that is occurring upstream as it attempts to establish characteristics consistent with its environment (NPS 2002b).

Many Glacier Area

The Many Glacier developed area is located on the east shore of Swiftcurrent Lake. The U.S. Geological Survey maintains a continuous gaging station at the lake's outlet. Flood-frequency analyses have identified 100- and 500-year flood flows. It is estimated that the Many Glacier Hotel lies within the 100-year floodplain of Swiftcurrent Lake.

The Swiftcurrent developed area consists of a campground, Restaurant/Store and parking lot, and various overnight accommodations. Two streams join in the area and flow into Swiftcurrent Lake immediately downstream of the developed area. The overnight facilities and the Restaurant/Store and parking lot are not at threat from the main river, but rather from Wilbur Creek upstream of the confluence. However, these facilities are located on high terraces and/or are behind large topographic features, which provide protection from all but extreme flood events. It appears that the motel area is out of the 500-year floodplain, and the store is out of the 100-year floodplain. Portions of the campground may be in the 100-year floodplain, but there are no surveys or modeling of the reach. The geomorphic floodplain of Swiftcurrent Creek is on the opposite bank from the campground and most, if not all floodwaters will occur on that side of the river during all but extremely large floods. National Park Service policy permits campgrounds in non-flash flood areas to be located in the 100-year floodplain, provided that warning and evacuation can be used to protect humans (NPS 2002b).

SOILS

The soils in Glacier National Park are characterized by a variety of parent materials, climates, topography, vegetation and ages. Land and Water Consulting completed a summary of their previous parkwide soil surveys in January 2001 (Dutton 2001). The report contains information about the general characteristics, distribution and management of park soils. Because a comprehensive description of all Glacier National Park soils is provided in the report, this section describes only soils for the Apgar Village, Lake McDonald, Rising Sun, Two Medicine, Many Glacier and Swiftcurrent developed areas. For additional soils information, refer to “Soils of Glacier National Park,” prepared by Barry Dutton (2001), which is on file in the Glacier National Park library.

Table 3-1 lists management interpretations for the soils (USDA 1993a, 1993b, 1998).

Table 3-2 below lists soil mapping units and characteristics at the developed sites (Dutton 2001).

Most of the developed sites are dominated by deep soils with sandy textures and high rock contents. Some small areas at several sites are subject to flooding by streams or lakes, and some small areas have wet soils with seasonal or permanent shallow water tables. Except for the flooded parts of these sites, the soils (due to their sandy texture and high rock content) are well suited for many development activities, including foundations, roads and trails.

TABLE 3-1. SOIL MANAGEMENT INTERPRETATIONS BASED ON HIGH, MEDIUM OR LOW POTENTIAL

SOIL/PARENT MATERIAL	PRODUCTIVITY/ REVEGETATION	ROADS	TRAILS	WEED INVASION	EROSION	WASTE DISPOSAL
ALLUVIAL SOILS						
Floodplain Soils	L	L	L	H	M	L
Alluvial Grassland Soils	M-H	H	H	H	M	M
Alluvial Forest Soils	M-H	H	H	H	M	M
Sandy/Cobbly Alluvial Forest Soils	M-H	H	H	H	H	M
Beach Soils	L-M	H	H	M	M	L
WET SOILS						
Wet Soils	H	L	L	M	L	L
GLACIAL SOILS						
Glacial Till Soils-Loam	M-H	M	M	M	H	H
BEDROCK SOILS—QUARTZITE & ARGILLITE						
Deep QA Colluvial Forest Soils	M	L	L	M	H	M
Colluvial Grassland Soils	M	H	H	H	M	M
Limestone Rock	L	L	L	L	L	L
Shallow Limestone Soils	L	L	L	L	M	L

L=low M=medium H=high

TABLE 3-2. SOIL MAP UNITS AND CHARACTERISTICS AT THE SIX DEVELOPED SITES

UNIT NAME	LOCATION	SOIL COMPONENTS	CLASSIFICATION OF MAJOR SOILS
ALLUVIAL SOILS			
FLOODED SOILS	Floodplains and low terraces	Well to poorly drained sandy and gravelly soils formed in alluvium from mixed rock sources.	Cryofluvents, Cryaquepts
ROCKY/SANDY ALLUVIAL GRASSLAND SOILS	Alluvial fans, high stream terraces and glacial outwash terraces	Well-drained sandy and gravelly soils formed in alluvium from mixed rock sources.	loamy-skeletal, mixed Typic Haplocryolls
ROCKY/SANDY ALLUVIAL FOREST SOILS	Alluvial fans, high stream terraces and glacial outwash terraces	Well-drained sandy and gravelly soils formed in alluvium from mixed rock sources.	loamy-skeletal, mixed Typic Dystocryepts, sandy-skeletal Typic Dystocryepts
MIXED ALLUVIAL FOREST SOILS	Alluvial fans, high stream terraces and glacial outwash terraces	Well-drained sandy and gravelly soils formed in alluvium from mixed rock sources. Some profiles have rock-free sandy surface layers.	loamy-skeletal, mixed Typic Dystocryepts, sandy-skeletal Typic Dystocryepts
LAKESIDE BEACH SOILS	Along shores of the larger lakes	Well-drained sandy and gravelly soils formed in beach deposits of uniform-size gravel.	Typic Cryorthents, Typic Dystocryepts
WET SOILS			
WET SOILS	Potholes, floodplains, lake margins, seeps	Somewhat poorly to very poorly drained mineral soils.	Cryaquolls, Cryaquepts
GLACIAL, LANDSLIDE AND MIXED SOILS			
SANDY GLACIAL TILL SOILS	Ground moraines with silty clay	Well-drained soils with silt loam or loam surface layers high in volcanic ash over sandy loam glacial drift subsoils.	loamy-skeletal, mixed Typic Haplocryepts
BEDROCK SOILS - QUARTZITE AND ARGILLITE			
DEEP AND MODERATELY DEEP COLLUVIAL FOREST SOILS	Cirque basins and lower glaciated trough walls	A complex of deep and moderately deep, well-drained soils with loam or silt loam surface layers high in volcanic ash and very gravelly to extremely gravelly loam or sandy loam subsoils.	loamy-skeletal, mixed Typic Haplocryepts and Dystrocryepts
BEDROCK SOILS - LIMESTONE			
ROCK OUTCROP AND SHALLOW SOILS ON LIMESTONE	Mountain tops, ridges and upper slopes	A complex of rock outcrop and shallow, well-drained soils with very to extremely gravelly loam or sandy loam textures throughout.	mixed Lithic Eutocryepts

Going-to-the-Sun Road Corridor

The McDonald Valley bottom on the west side of the Going-to-the-Sun Road corridor is mainly silty clay loam, glacial forest soil. The far west end of the corridor contains several soil types, including mixed glacial forest soils, deep colluvial forest soils, sandy over gravelly alluvial soils and small areas of rock outcrops. As the elevation rises in the middle section of the Going-to-the-Sun Road corridor, soils are mostly bedrock, including rock outcrops and talus, and colluvial forest soils.

The Apgar developed area is mainly beach soils by the lake, with small sections of flooded soils along Lower McDonald Creek and small sections of sandy over cobbly alluvial soils in the southern part of the area (Dutton 2001, Nimlos 1979). The lakeside beach soils are mainly sandy soil textured and usually contain over 70% uniform-sized gravels. These soils were originally deposited as alluvium,

then reworked by wave action along the Lake McDonald shoreline. They show little profile development and are very porous. They have very low water and nutrient-holding capacities and low to moderate productivity. These soils are rated high for roads and trails due to their sandy texture and high rock content. They are rated moderate for weed invasion and erosion potential. Waste disposal is rated low on these soils since they are too porous to provide adequate treatment and wastes move rapidly through them to the surface or groundwater. Portions of these soils have flooded in the past during very high lake levels caused by unusual runoffs.

The flooded soils along Lower McDonald Creek have also mainly sandy textures and high rock content. They are flooded on a regular basis with soil material either eroded or deposited during each event. They also show little profile development, are very porous, and have very low water and nutrient holding capacities and low productivity. These soils are rated low for roads and trails due to flooding. They are rated high for potential weed invasion due to regular disturbance by floods that cause bare soil readily invaded by weeds. Erosion potential is moderate for these soils. Waste disposal is rated low due to flooding, shallow groundwater and sandy, porous textures.

The sandy over cobbly alluvial soils are mainly sandy textured and have high rock content in the lower layers. They have a surface layer of sandy loam, loam, or silt loam with few rocks (Dutton 1989). The lower layers were deposited by stream action, but the upper layer was deposited in a larger Lake McDonald near the end of the ice age. These soils are rated as moderate to high for productivity due to the high nutrient and water-holding capacity of the surface soil. They are rated high for roads and trails due to their sandy and rocky subsoil. They are rated high for weed invasion because of their climate and sandy subsoil texture. Although these soils are rated high for potential erosion, they are protected from erosion by a layer of partially decomposed plant litter. They are rated moderate for waste disposal due to porous subsoil that provides limited treatment.

The Lake McDonald Lodge developed area is dominated by rocky and sandy alluvial forest soils with small sections of flooded soils along Snyder Creek. The entire site is on an alluvial fan of Snyder Creek. These alluvial forest soils have a surface layer of loam or sandy loam with sandy textures below. The soil is rocky throughout and rock content increases with depth. Except for the flooded parts of this site, the soils are well suited for many development activities, such as foundations, roads and trails because of their sandy texture and high rock content. They are rated moderate to high for productivity and high for roads and trails. They are also rated high for potential weed invasion because of their sandy texture. Erosion potential is rated moderate, but the soils are protected from erosion by a layer of partially decomposed plant litter. Waste disposal is rated moderate due to porous subsoil, which may not provide adequate treatment and may allow wastes to move rapidly to surface or groundwater.

The St. Mary River Valley to St. Mary Lake is dominated by mixed glacial forest soils. The higher elevations on the east side of the Going-to-the-Sun Road corridor are mainly rock outcrops, shallow soils, colluvial soils and ice-patterned soils with mixed glacial and colluvial soils in the valleys. The St. Mary Valley floor is mainly mixed conifer and aspen forest soils, and contains small areas of rocky and sandy alluvial forest and grassland soils scattered along the lake.

The Rising Sun developed area is situated on an alluvial fan of Rose Creek. The major soils in the area are rocky and sandy alluvial grassland soils. In addition, small sections of flooded soils are present along Rose Creek. These alluvial grassland soils have a dark surface layer with a loam or sandy loam texture and a sandy texture below. The soil is rocky throughout and rock content increases with depth. Sand content decreases and clay content increases on the eastern border of this site. The rocky and sandy alluvial grassland soils are well suited for many development activities due to a high subsoil

rock content and good drainage. The productivity and revegetation potentials for these soils are moderate to high overall, but decreasing in the subsoil due to higher rock content and lower water and nutrient holding capacity. The soil is highly susceptible to weed invasion because of its sandy texture, grassland climate and frequent disturbance by burrowing animals. Erosion potential is rated moderate on these soils. Waste disposal is moderate because the subsoils have rapid permeability and provide poor wastewater filtration.

Two Medicine Area

Soils in the Two Medicine area vary throughout. The area is mainly rock outcrops, shallow soils and talus at higher elevations and mixed glacial and colluvial soils toward the valleys. The entire east side of the area is dominated by mixed conifer and aspen forest soils intermixed with small areas of deep, rocky colluvial and landslide soils as well as clay-rich grassland soils.

The Two Medicine developed area has mostly rocky and sandy alluvial forest soils with small areas of flooded soils along Appistoki Creek. The entire site is on the edge of an alluvial fan deposited by Appistoki Creek. The soils at this site are marginally similar to the rocky and sandy grassland soils, but mostly are similar to the rocky and sandy alluvial forest soils. These alluvial forest soils have a surface layer of loam or sandy loam with sandy textures below. The soil is rocky throughout and rock content increases with depth. Except for the flooded portions of this site, the soils are well suited for many development activities, such as foundations, roads and trails because of their sandy texture and high rock content. They are rated moderate to high for productivity and high for roads and trails. They are rated high for potential weed invasion due to their sandy texture. Erosion potential of these soils is rated moderate, but they are protected from erosion by a layer of partially decomposed plant litter. Waste disposal is rated moderate due to porous subsoil, which may not provide adequate treatment and may allow wastes to move rapidly to surface or groundwater.

Many Glacier

Changing glaciation in the Many Glacier Valley has created diverse soil types in the area. Rock outcrops and shallow soils dominate the area along the Continental Divide and a small section in the northeast. Rock outcrops, shallow soils and ice-patterned soils, as well as mixed glacial and colluvial soils dominate the high to middle elevations away from the Continental Divide. The valley floor is mainly mixed conifer and aspen forest soils with small pockets of deep, rocky colluvial and landslide soils and clay-rich grassland soils.

The Many Glacier developed area is mainly limestone rock outcrop and shallow limestone soils (LC1/LC4). The rock outcrop (LC1) is limestone of the altn formation (Whipple 1992). The shallow limestone soils (LC2) have loam or sandy loam surfaces with high rock content. There is fractured bedrock at 1 to 2 feet, but small sections occur where the soil is deeper. Productivity is low. The shallow bedrock restricts most uses — road and trail construction is rated low due to the difficulty of excavating level surfaces. However, trails function well if deep excavation is not required. Foundations may require blasting, but are stable if built in bedrock. Dry site conditions make the potential weed invasion high. The erosion potential is moderate. Waste disposal is rated low on this soil due to the shallow bedrock.

There is a different soil profile at the northwest and southwest corners of the site, which have deeper soils with less severe soil management limitations. These deep glacial soils have moderate to high productivity, moderate road and trail potential and moderate potential weed invasion. Erosion potential is high due to the loam or silt loam surface texture, but there is protection from erosion by a layer of

partially decomposed plant litter. Waste disposal potential is high since the soils are deep, well drained, not flooded and have moderate permeabilities.

Soils at the Swiftcurrent area are a complex of glacial and bedrock soils along with alluvial, wet and other soils (Dutton 2001). However, the Swiftcurrent developed area is actually mainly rocky and sandy alluvial forest soils (Dutton 1989). The site occupies an alluvial terrace of Swiftcurrent Creek. The soils have a surface layer of loam or sandy loam with sandy textures below. The soil is rocky throughout and rock content increases with depth. Due to their sandy texture and high rock content, these soils are well suited for many development activities, including foundations, roads and trails. They are rated moderate to high for productivity and high for roads and trails. They are rated high for potential weed invasion due to their sandy texture. Erosion potential is rated moderate, but these soils are protected from erosion by a layer of partially decomposed plant litter. Waste disposal is rated moderate due to porous subsoil, which may not provide adequate treatment and may allow wastes to move rapidly to surface or groundwater.

Goat Haunt-Belly River

There are diverse soil types in the Goat Haunt-Belly River area. Rock outcrops, talus and deep colluvial forest soils dominate the soils along the Continental Divide, the ridges of the Livingston Range, and ridges of the Lewis Range in the area. Bands in the middle elevation throughout the area are mainly rock outcrops, shallow soils, talus and deep colluvial forest soils. The southwest part of the area is mainly colluvial soil, and shallow and alpine meadow soil. Valley bottoms in the area are generally mixed glacial and colluvial soils. The Goat Haunt Valley is mainly mixed glacial forest soils, and the Belly River Valley is dominated by mixed conifer and aspen forest soils and deep, rocky colluvial and landslide soils.

Middle Fork

The Middle Fork area contains a mosaic of soil types. The higher elevations are dominated by bedrock soils, mostly rock outcrops, shallow soils, talus and colluvial soils. The valley bottoms are composed predominantly of mixed glacial and colluvial soils and loamy glacial forest soils with a portion in the northwest dominated by silty clay loam glacial forest soils and small areas on the west side with mixed alluvial forest soils.

VEGETATION

The vegetation of Glacier National Park falls into four broad geographic patterns: arctic-alpine, northern coniferous forest (boreal), western montane (cordilleran) and Great Plains (Lesica 2002). In the northern Rockies, the Continental Divide is the boundary between the semi-arid continental climate of the Great Plains and the temperate maritime climate of the northern Rocky Mountains to the west. Glacier National Park is located along the main chain of the Rocky Mountains in the middle of the western montane region and just southwest of the northern coniferous region, and the park's vegetation is dominated by species typical of those regions. Western montane species are found at all elevations in all habitats, while northern coniferous species are in forests and wetlands, and arctic-alpine plants occur mainly above treeline. There are only a few Great Plains species along the east edge of the park where the sharp rise of



the mountains brings more precipitation. The meeting of the four regions causes many species to be at the limits of their distribution in the park.

The park supports over 1,100 species of vascular plants (Lesica 2002) and at least 870 non-vascular plants (DeBolt and McCune 1993, Hermann 1969, Elliott 1987). Large-scale climatic influences and the variety of environmental conditions in the park promote vegetation diversity. In addition, local climate that changes with elevation and proximity to mountain ridges or large bodies of water affects vegetation. The steep, variable terrain, ranging from approximately 3,200 to 10,500 feet, has clear contrasts in temperature and precipitation over relatively short distances. Fire, glaciation and other geologic processes have also influenced the distribution of vegetation and led to the isolation of some species.

Types of vegetative land cover in the park include: dry herbaceous, (plants and shrubs that grow in dry areas — approximately 77,067 acres); mesic herbaceous (plants and shrubs that grow in wet areas, including riparian areas — approximately 48,821 acres); deciduous trees and shrubs (64,924 acres); coniferous forests and dense mesic areas (334,943 acres); coniferous forest and open dry areas (160,744 acres); and barren rock, snow and ice (298,357 acres).

Major types of vegetation community are grasslands (dry herbaceous), pine or woodland savannahs (open, dry coniferous and deciduous), bottomland forests (mesic herbaceous and deciduous), ponderosa pine/Douglas fir (*Pinus ponderosa/Pseudotsuga menziesii*) forests (open, dry coniferous), western redcedar/western hemlock (*Thuja plicata/Tsuga heterophylla*) forests (dense, mesic coniferous), spruce/fir forests (dense, mesic coniferous land cover) and alpine communities (mesic herbaceous and barren). Other communities include marshes, swamps and lakes, and barren, rocky talus slopes (Habeck 1970). Although these latter habitats cover only a small area in the park, they are an important component of the park's diversity and contain many species of special concern.

The vegetation of Glacier National Park also includes nearly 130 species of exotic plants (Lesica 2002), or 10% of the park's flora, that have been intentionally or inadvertently introduced. A number of these species are increasing in area and density. They are consequently threatening the perpetuation of native plant communities and impacting habitat for wildlife in the park. Exotic plants are also spreading into backcountry areas, affecting the park's pristine quality and consequently the enjoyment of wildlife and recreation. Exotics occur in disturbed areas, such as roadsides, construction projects, old homesteads, grazed fields, trails, burns, floodplains and utility sites. Spread occurs when visitors, construction equipment, animals, wind and water transport seeds.

Maintained lawns and flower gardens in developed areas in the park have also been a source of non-native species. While the park encourages the use of native plants in gardens and landscaping, many ornamentals were introduced in the past. Some non-native annuals and perennials are still used in certain concession areas and other cultivated areas.

Going-to-the-Sun Road Corridor

On the west side of the Going-to-the-Sun Road corridor, the vegetation in the Lower McDonald Valley is dominated by several successional stages of the moist western redcedar-western hemlock forest type. McDonald Valley is the easternmost location with this forest type, indicating a Pacific maritime climate influence. Since redcedar and hemlock do not establish quickly in recently opened stands, areas that have had more recent fires are comprised mostly of pioneering species, such as lodgepole pine, western larch, aspen, paper birch and black cottonwood. As the forests mature, Douglas fir, western larch, Engelmann spruce and western white pine begin to dominate the overstory in different

proportions. Western hemlock and western redcedar mostly grow in late seral and old growth stands that are often centuries old. Subalpine fir grow in several successional stages, while scattered grand fir grow only in later-seral forests. Common understory species in these forest types include huckleberry, spiraea, snowberry, twinflower, beargrass, mountain lover, round-leaved violet, heartleaf arnica, pinegrass, prince's-pine and queencup beadlily. While most of these forest communities are the western redcedar/queencup beadlily habitat type, several sections are in the more rare western redcedar/devil's club and western hemlock/queencup beadlily habitat types. These habitats are the result of the topography, elevation, slope and climate around Lake McDonald. There are also scattered Douglas fir habitat types in this area.

Also in the McDonald Valley, riparian vegetation dominates bottomland areas along lakes, rivers and streams. Western redcedar, Engelmann spruce and white spruce are often found with black cottonwood. Understory species include red-osier dogwood, willow, alder, mountain maple, chokecherry, horsetail, false starry Solomon's-seal, cow parsnip, sweet cicely and various sedges and grasses. Other moist forests are mainly comprised of Engelmann spruce and subalpine fir with similar understory species. Wetlands, including wet meadows, swamps, marshes and fens are also scattered throughout the McDonald Valley, particularly above Lake McDonald and along the Camas Road. Bluejoint reedgrass, willows and alders are the typical vegetation of wet meadows and swamps, while beaked sedge, slender sedge and horsetail are typical of marshes and fens. Many of these areas also support a number of species of concern.

On the east side of the Going-to-the-Sun Road corridor, the vegetation in the St. Mary Valley is a mix of coniferous forest, deciduous forest and grassland. Along the eastern border of the valley, aspen groves and grasslands form extensive parklands. Aspen, sometimes mixed with black cottonwood, Engelmann spruce, lodgepole pine and Douglas fir, extends along the lowslope and toeslopes above St. Mary Lake, particularly along the eastern end. The understory of these groves is comprised of snowberry, serviceberry, red-osier dogwood, prickly rose, cow parsnip, western sweet-cicely, showy aster, arnica, western meadowrue and various grasses. Alluvial fans, interspersed in the aspen groves, are dominated by fescue grasslands. The vegetation includes grasses such as Idaho fescue, rough fescue, bluebunch wheatgrass, oatgrass, needlegrass and sedges. Dominant forbs include silky lupine, slender cinquefoil, yarrow and balsamroot. These grasslands also occur as dry outcrops along the mountain slopes.

At lower elevations in the St. Mary Valley, Douglas fir usually grows in the warm, dry exposures, forming a mosaic pattern of vegetative communities with Engelmann spruce-subalpine fir. Douglas fir forests are on the dry mid-slopes, often mixed with lodgepole pine, subalpine fir, Engelmann spruce and limber pine. The understory also tends to be dry, and is comprised of species often found in the nearby grasslands, as well as common juniper and kinnikinnick. Moister areas contain snowberry, spiraea, arnica and pinegrass. Engelmann spruce and subalpine fir grow on the lower moist slopes above St. Mary Lake, often with lodgepole pine and sometimes with black cottonwood and aspen. Drier spruce/fir forests usually grow in the subalpine fir/dwarf huckleberry or /twinflower habitat types, while moist spruce/fir forests are generally subalpine fir/queencup beadlily or /grouse whortleberry habitat types. The wettest areas along the lake and in the Red Eagle drainage contain moist aspen groves, spruce/horsetail forests and wetlands dominated by shrub and sedge. Riparian and wetland vegetation also grows along Divide Creek and other creeks throughout the valley.

At increased elevations in both valleys, subalpine fir, Engelmann spruce and lodgepole pine dominate forest communities. On the east side of the park, whitebark pine is a significant presence in treeline communities along south-facing slopes, and alpine larch is sometimes scattered on north-facing slopes. Lower subalpine forests, particularly west of the Continental Divide, may still have Douglas fir,

western larch and western white pine. Common understory species for these subalpine forest communities include fool's huckleberry, thimbleberry, mountain ash, spiraea, huckleberry, arnica, twinflower, queencup beadlelily, grouse whortleberry, arrow-leaved groundsel and beargrass. Higher elevation forests support beargrass, glacier lily, mountain-heather and woodrush in the understory. Areas that have had more recent fires have more paper birch, quaking aspen, lodgepole pine, western larch and scattered Douglas fir. Areas that have continued disturbance, such as avalanche chutes along steep mountain slopes, are mainly comprised of tall shrubs, such as green alder, serviceberry, thimbleberry, elderberry, fireweed and cow parsnip. In still higher elevation near Logan Pass, the subalpine fir and Engelmann spruce take on wind- and frost-stunted, shrubby forms, called "krummholz." Beyond these areas there are diverse alpine meadows, turf communities, wet meadows, talus slopes and fellfields that support a number of rare plants.

The area surrounding Granite Park Chalet is dominated by dispersed krummholz of subalpine fir. Ground cover is composed of glacier lily, groundsel, mountain sorrel, monkey flower, Brewer's miterwort and alpine timothy. South and east of the ridge where the chalet is located there is a broad, marshy valley mainly comprised of interspersed subalpine fir and Engelmann spruce, huckleberry, elderberry, beargrass, alpine willow herb, false hellebore, glacier lily and numerous rushes and sedges. Below and north of the chalet, there are denser stands of subalpine fir, Engelmann spruce and other conifer species.

The area around Sperry Chalet has a variety of vegetation community types. Vegetation includes forest of subalpine fir/Engelmann spruce/hellebore, meadow of hellebore/groundsel/sedge, rock outcropping of rush/penstemon, forest of dry subalpine fir/mock hazel and rocky ledge subalpine fir krummholz/beargrass/penstemon.

Populations of noxious weeds (plants that grow invasively to the detriment of other plants) in the Going-to-the-Sun Road corridor vary from individual occurrences to large infestations. In the McDonald Valley (including the Camas Road), state-listed noxious weeds infest approximately 245 acres (NPS 2001a). Weeds include spotted knapweed, oxeye daisy, Canada thistle, houndstongue, leafy spurge, orange hawkweed, St. Johnswort, Dalmatian toadflax, sulfur cinquefoil and common tansy. Ninety-seven acres, or 40%, are in the backcountry. There are approximately 310 acres of noxious weed infestation in the St. Mary Valley, the highest of any area in the park. Most of this infestation is in the frontcountry along the Going-to-the-Sun Road, in development areas, and in the fescue grasslands adjacent to the road. Only approximately 4 acres, or 1.3%, are in the backcountry zone. Weeds in the St. Mary Valley include spotted knapweed, oxeye daisy, Canada thistle, houndstongue, St. Johnswort, orange hawkweed, leafy spurge and common tansy.

The Apgar area is heavily forested and relatively flat in comparison with the surrounding area. The most common habitat type (for potential or "climax" vegetation) in this area is western redcedar or western hemlock/queencup beadlelily. Because the area burned in a 1929 fire, a large portion of the present vegetation in the Apgar area is an early successional forest. Lodgepole pine and a few scattered western larch create a dense overstory with a large amount of Engelmann spruce regenerating in the understory. Other trees regenerating in the understory include western redcedar, western hemlock, western white pine and Douglas fir. Black cottonwood and paper birch grow in forest openings. Common understory species in this area include twinflower, prince's-pine, queencup beadlelily, spiraea, bunchberry dogwood and thimbleberry.

In spite of past disturbance, the forest that is closer to the buildings in the Apgar Village area is a mid-seral western redcedar/western hemlock community. There are large clusters of western redcedar scattered around the buildings, mixed with larger Douglas fir, Engelmann spruce, lodgepole pine and

western white pine. Black cottonwood, paper birch and lodgepole pine only dominate in areas that have had the heaviest use. Understory species are similar to those listed above, but there is more maintained lawn near the structures that are dominated by non-native grasses.

A strip of land along Lake McDonald and Lower McDonald Creek supports riparian vegetation. While western redcedar and Engelmann spruce are still common, there is more black cottonwood and paper birch in the overstory. Willows, alder and sedges dominate the understory.

There are approximately 2 acres of noxious weeds in the Apgar Village developed area. These weeds include spotted knapweed, oxeye daisy and common tansy.

The Lake McDonald developed area is also in a western redcedar/queencup beadlelily habitat type. A mature, 230-year old forest surrounds the area (Barrett 1997) and is dominated by very large western redcedar (16 to more than 22 inches in diameter at breast height) mixed with large western larch, western white pine and Douglas fir. The midstory contains mainly pole- and sapling-sized western hemlocks. The low-growing open understory includes twinflower, sidebells wintergreen, queencup beadlelily, round-leaved violet, foam flower, snowberry, prince's-pine, northwest sedge, roughleaf ricegrass and beargrass. There are numerous old-growth black cottonwood trees (20 to 30 inches diameter at breast height) on the edge of this forest near the southern access road. An example of this forest type is south of Snyder Creek between Going-to-the Sun Road and the southern access road, and incorporates the Jammer Dormitory area.

Forest buffers between the Lake McDonald developed area and Going-to-the-Sun Road have been preserved. East of the Post Office, the forest is mainly western larch with scattered lodgepole pine, Douglas fir and Engelmann spruce. Numerous pole- and sapling-sized western hemlock and western redcedar saplings are in the understory. Other understory species include beargrass, snowberry, queencup beadlelily, twinflower, round-leaved violet and prince's-pine. Near the Post Office, there are more black cottonwood and paper birch trees, as well as more non-native grasses in the understory at the edge of the forest.

Snyder Creek and the shoreline of Lake McDonald support riparian vegetation. Along the creek, overstory trees are large western redcedar, black cottonwood and paper birch. Saplings and pole-size trees of all three species are regenerating along the creek edge. Common understory plants include mountain maple, red-osier dogwood, alder and willow. Similar trees grow along the shoreline of Lake McDonald, and there are also Douglas fir, Engelmann spruce and a few subalpine fir seedlings. Vehicle traffic and human trampling have generally denuded the area's understory vegetation. Species that do exist include snowberry, serviceberry, mountain maple and red-osier dogwood.

Trees of various species are sparsely scattered around the Lake McDonald buildings. They include black cottonwood, paper birch, western redcedar, western hemlock, Engelmann spruce, western larch, western white pine, lodgepole pine and subalpine fir. Clearings around the lodge buildings and roads have lawns or artificially maintained open space that support many non-native species, such as Kentucky bluegrass, orchardgrass, quackgrass, clover, spotted knapweed, oxeye daisy and St. Johnswort. Spotted knapweed, oxeye daisy and St. Johnswort are state-listed noxious weeds that infest nearly 10 acres in the Lake McDonald developed area. Overstory trees are sparse in these areas, and include mostly black cottonwood, paper birch and western redcedar.

**Forest buffers
between the Lake
McDonald developed
area and Going-to-
the-Sun Road have
been preserved.**

The vegetation around the Rising Sun developed area is a mosaic of dense forest, open forest, riparian vegetation and fescue grassland. The developed area mainly includes Douglas fir community types. The overstory is a mix of Douglas fir, lodgepole pine and limber pine with some subalpine fir and Engelmann spruce regeneration in the understory. The overstory is dense throughout the campground and north of the Rising Sun General Store/Motel with very mature Douglas fir trees and a few remnant western larch, but it tends to be open along Going-to-the-Sun Road and near the boat dock. Fescue grasslands grow east of Rising Sun along both sides of Going-to-the-Sun Road. Lodgepole pine and Douglas fir have started to invade the meadows along their western front. Grassland vegetation also dominates the understory in the open-canopy Douglas fir/limber pine areas. The upper slopes above the campground have similar vegetation.

The shoreline vegetation of St. Mary Lake is mostly the Engelmann spruce/subalpine fir forest type, although scattered black cottonwood and lodgepole pine also grow there. Willow and alder are most common along the rocky shoreline. Riparian vegetation can also be found along Rose Creek. The creek bed is very rocky, but black cottonwood, Engelmann spruce and some lodgepole pine are scattered in the floodplain. Willows and alder also grow here.

There are approximately 36 acres of noxious weeds in the Rising Sun developed area. They grow throughout the campground, structures, picnic area and boat dock area. Weed species include spotted knapweed, oxeye daisy, Canada thistle, houndstongue and St. Johnswort.

Two Medicine

At lower elevations, most of the Two Medicine Valley is dominated by coniferous forest that includes lodgepole pine, subalpine fir, Engelmann spruce and Douglas fir. Limber pine grows occasionally in more open stands. These areas are in various subalpine fir habitat types at several stages of succession. Understory species include beargrass, huckleberry, false huckleberry, spiraea, alder, thimbleberry, twinflower, queencup beadlily and arnica. The slightly moister phases of this forest type can also contain Solomon's-seal, pathfinder and various fern species. Quaking aspen stands, often mixed with black cottonwood, are the dominant vegetation near the eastern border of the park along Two Medicine Lake and are sometimes interspersed in the coniferous forest. Understory species here include red-osier dogwood, alder, sweet cicely, cow parsnip, false hellebore and various grasses. Small fescue grasslands and mixed shrublands are scattered throughout the montane zone. Rough fescue generally dominates the grasslands, while alder, mountain ash and mountain maple are common in low elevation shrublands.

Riparian vegetation is common in low elevations along Two Medicine Creek, Appistoki Creek and along the various lakes and smaller streams. Overstory trees in these areas are mainly Engelmann spruce, black cottonwood, quaking aspen and paper birch. Understory species include willows, alders, red-osier dogwood, mountain maple, cow parsnip, Solomon's seal, sweet cicely, asters and various sedges and grasses. Wetlands, often dominated by willow and sedges, occur in depressions near streams and at lake inlets.

Vegetation along the upper slopes is subalpine fir, Engelmann spruce, lodgepole pine and whitebark pine, with occasional Douglas fir and quaking aspen. Most of the upper slopes do not have dense overstory canopies, but are open with shrubby understories. Common understory species here include huckleberry, false huckleberry, green alder, beargrass, gooseberry, juniper, grouse whortleberry, Sitka valerian, arrowleaf groundsel, elk sedge and woodrush. Mixed shrubfields are scattered in the forested areas in avalanche chutes. Dominant species include alder, false huckleberry, mountain maple,

chokecherry, thimbleberry and fireweed. Idaho fescue/wheatgrass grasslands also grow on rock outcrops or terraces. Closer to the Continental Divide, krummholz subalpine fir forests dominate along with alpine meadows, turf communities, talus slopes and fellfields. These areas mainly consist of numerous sedges, alpine grasses and forbs.

Noxious weeds have invaded approximately 30 acres in the Two Medicine Valley (NPS 2001a). These species include spotted knapweed, oxeye daisy, Canada thistle, houndstongue, Dalmatian toadflax, sulfur cinquefoil and common tansy. Only spotted knapweed, oxeye daisy and Canada thistle have invaded approximately 1 acre, or 3.3% of the backcountry.

Vegetation in the Two Medicine developed area is comprised mainly of subalpine fir forest types. Parts of this area, particularly east of the ranger station and south of Appistoki Creek, are dense forest dominated by subalpine fir, lodgepole pine, Engelmann spruce with occasional Douglas fir, limber pine and whitebark pine. Common understory species include snowberry, serviceberry, spiraea, huckleberry, false huckleberry, beargrass, Utah honeysuckle, arnica and elk sedge.

Much of the area near the campground, picnic area and other structures supports an open canopy forest because of these developments. Lodgepole pine, subalpine fir, Engelmann spruce, black cottonwood and aspen are only scattered throughout the area. Understory species include those listed above, although some areas near the ranger station, campground, picnic area and General Store have either been converted to lawn or support exotic species.

Appistoki Creek, south of the picnic area, is mostly a disturbed gravel bar because of previous flooding and human diversion of the creek bed. Most of the area not vegetated, although there are scattered willows and grass species in the gravel bar. There is also riparian vegetation by the shore of Two Medicine Lake that includes alder, willow and various forbs, grasses and sedges.

A small fescue grassland on the northeast side of Pray Lake near the campground includes mostly Idaho fescue, rough fescue, oatgrass, woodrush, buckwheat, pussytoes and mountain sandwort. Lodgepole pine is slowly moving into the meadow.

Noxious weeds in the Two Medicine developed area include spotted knapweed, common tansy and Canada thistle. Weeds have invaded approximately 4 acres.

Many Glacier

The changing glaciation in the Many Glacier Valley has created diverse vegetation in the area. On the valley floor, subalpine fir habitat types, or climax forests, generally dominate the lower montane forest. The current overstory is a mix of subalpine fir, Engelmann spruce, lodgepole pine and occasional Douglas fir. There are wetter pockets of aspen and black cottonwood throughout this area, and moist Engelmann spruce forests in depressions. Common understory species include huckleberry, dwarf huckleberry, alder, false huckleberry, beargrass, queencup beadlily, thimbleberry and cow parsnip. Solomon's-seal, asters, false hellebore and bluejoint reedgrass are more common in wetter areas.

Fescue grasslands are interspersed throughout the montane forest and on the north-facing slopes at middle elevations. Species mainly include rough fescue, Idaho fescue, wheatgrass, needlegrass, lupine, cinquefoil, shrubby cinquefoil and kinnikinnick. There are also a number of shrublands on the middle elevation slopes. They are dominated by serviceberry, beargrass and thimbleberry. Riparian areas are

also scattered throughout the montane zone. Vegetation includes Engelmann spruce/willow, willow/alder, and herbaceous wetlands consist of sedges, bulrush, cattails and bluejoint reedgrass.

At higher elevations, lodgepole pine, subalpine fir, Engelmann spruce and some aspen dominate the overstory. Near the treeline and along ridges, whitebark pine is also common. The understory is generally comprised of huckleberry, false huckleberry, beargrass, spiraea, thimbleberry, elk sedge and queencup beadlily. Alpine meadows and shrubfields are scattered in forest openings and above the treeline. They contain tall shrub areas in avalanche chutes comprised of green alder, serviceberry, thimbleberry, chokecherry and mountain maple, as well as herbaceous meadows that are dominated by beargrass, huckleberry, fireweed, Sitka valerian, glacier lily, buttercup, shootingstar and paintbrush. Talus and scree slopes, composed of both limestone and quartzite/argillite rock outcrops, are at the highest elevations. There are some dispersed subalpine fir and whitebark pine, but the vegetation is mostly lichens, spotted saxifrage, arrowleaf groundsel, buckwheats, cinquefoil and alpine dryad.

Noxious weeds infest approximately 98 acres in the Many Glacier Valley (NPS 2001a). State-listed noxious weeds include spotted knapweed, oxeye daisy, Canada thistle, houndstongue, leafy spurge, Dalmatian toadflax, and sulfur cinquefoil.

Most of the vegetation around the Many Glacier Hotel and associated outbuildings is lodgepole pine and subalpine fir with scattered Engelmann spruce, black cottonwood and aspen in the overstory. The understory is generally a subalpine fir/queencup beadlily habitat type, or climax forest. The forest near the developments tends to be denser east and south of the hotel. There are only a few scattered trees to the north of the hotel, with mainly young black cottonwood in the overstory. Most of the understory around the buildings is lawn that contains a number of exotic grasses and forbs. In nearby forested areas, the understory includes huckleberry, snowberry, queencup beadlily, beargrass, buffaloberry, spiraea and serviceberry.

Southeast of the hotel, small aspen groves grow with a moister understory. There are more aspen groves and fescue-kinnikinnick meadows near the rocky ridge east of the hotel. Wetland and riparian vegetation grows on the shores of Swiftcurrent Lake and Governor's Pond. Lodgepole pine and Engelmann spruce tend to dominate the overstory, while willows, alder, cattail and sedges are common understory species.

Noxious weeds have infested approximately 13 acres around the Many Glacier Hotel and outbuildings (NPS 2001a). These weeds include spotted knapweed, houndstongue and Canada thistle.

The majority of the Swiftcurrent developed area is a dense wood of seral lodgepole pine, interspersed with black cottonwood, quaking aspen, subalpine fir, Engelmann spruce and Douglas fir. The understory is mostly beargrass with scattered snowberry, false huckleberry, serviceberry, buffaloberry, willow, Utah honeysuckle, chokecherry, queencup beadlily and arnica. Like the Many Glacier developed area, this forest can be classified as subalpine fir/queencup beadlily habitat type. Much of the understory near structures in this area has been converted to lawn or is dominated by exotic species.

Along Wilbur Creek, the vegetation is mainly lodgepole pine and quaking aspen with some scattered subalpine fir. Species in the understory include bluejoint reedgrass, Solomon's-seal, thimbleberry, green alder, willow and red-osier dogwood. Open areas scattered in the moist forest have wet meadows that are mainly bluejoint reedgrass.

Noxious weeds have invaded approximately 14 acres in this area, including the Many Glacier Campground (NPS 2001a). State-listed noxious weeds here include spotted knapweed, oxeye daisy, Canada thistle and sulfur cinquefoil.

Goat Haunt-Belly River

The Goat Haunt Valley is mainly coniferous forest, most of which is in the subalpine fir/queencup beadlily habitat types. Subalpine fir and Engelmann spruce dominate later seral forests, while lodgepole pine, Douglas fir, Engelmann spruce, western larch, black cottonwood, quaking aspen and paper birch are components of younger forests. Common understory species include queencup beadlily, huckleberry, false huckleberry, arnica, beargrass, thimbleberry, snowberry, serviceberry and pinegrass. Moister sections are generally dominated by Engelmann spruce and subalpine fir and may also include wild sarsaparilla, alder, starry Solomon's seal, twinflower, red-osier dogwood and bluejoint reedgrass in the understory. Wetter spruce forests along lakes and streams and dry Douglas fir dominated areas on steep rock outcrops are interspersed in the spruce/fir forest. Large and small wetlands, dominated by sedges and willows, occur throughout the valley.

In contrast, the Belly River Valley is a mix of deciduous forest, coniferous forest, grassland and riparian communities. On the eastern border, the vegetation is mainly a mixed aspen/conifer forest. Quaking aspen and lodgepole pine dominate the overstory with scattered Engelmann spruce and subalpine fir. Common understory species include thimbleberry, snowberry, Wood's rose, cow parsnip, false hellebore, fireweed, sweet-cicely, angelica and bluejoint reedgrass. Occasional wet areas support willow and other wetland vegetation.

Willows dominate along the Belly River floodplain, sometimes mixed with black cottonwood, spruce and aspen. Alluvial terraces, just above the river, are mainly fescue grassland. Rough fescue, Idaho fescue, sedge, needlegrass, oatgrass and wheatgrass are common grasses in this area, while shrubby cinquefoil, yarrow, strawberry, bedstraw, smooth aster, geranium and cinquefoils are common forbs and shrubs. Timothy and Kentucky bluegrass, exotic grasses, are common in some of these areas due to past disturbance.

Moist coniferous forest throughout the rest of the Belly River Valley generally dominates the area with lodgepole pine, Engelmann spruce, subalpine fir and Douglas fir in the overstory. Most of the forest is a mosaic of several subalpine fir habitat types at different stages of maturity. Black cottonwood, aspen and paper birch are in younger forests, and along larger streams and lakes throughout the valley. Huckleberry, false huckleberry, spiraea, snowberry, beargrass, queencup beadlily, arnica, elk sedge and pinegrass are common in the understory.

In both valleys, as elevation increases, subalpine fir, Engelmann spruce, lodgepole pine, whitebark pine and sometimes limber pine and alpine larch dominate the forests. Understory species includes huckleberry, grouse whortleberry, juniper, beargrass, elk sedge, pinegrass, Sitka valerian and arnica. Shrubs in avalanche chutes are mainly species such as green alder, chokecherry, serviceberry, thimbleberry and Rocky Mountain maple. As in other high elevation areas of the park, stunted krummholz forests grow near the treeline, mixed with alpine meadows, talus slopes, turf communities and fellfields. Species in these areas include subalpine fir, whitebark pine, alpine dryad, woodrush, beargrass, moss campion and cinquefoil, as well as various species of grasses, rushes, sedges.

Noxious weeds infest approximately 20 acres in the Goat Haunt-Belly River Valleys (NPS 2001a). State-listed noxious weeds include spotted knapweed, oxeye daisy, Canada thistle, orange hawkweed and sulfur cinquefoil. Almost 12 acres, or 60%, are in the backcountry.

Middle Fork

The Middle Fork area is covered mostly with a dense forest of even-aged stands initiated by fire, which consist of lodgepole pine and western larch (Barrett 1986). The potential climax species in this area are Engelmann spruce and subalpine fir, but frequent fires have limited their distribution. Consequently, they are only scattered in the overstory or regenerating in the understory. There are pockets of western redcedar-western hemlock habitat types in cool, moist sites along tributaries of the Middle Fork between Lincoln Creek and Nyack Creek. Douglas fir, black cottonwood and paper birch are also scattered throughout the area. Understory vegetation in these lower montane forests includes huckleberry, false huckleberry, buffaloberry, queencup beadlily, Oregon grape, pinegrass, arnica, beargrass, twinflower and elk sedge.

The vegetation at higher elevations is a cooler coniferous forest with an overstory of subalpine fir, Engelmann spruce, lodgepole pine and occasional Douglas fir and whitebark pine. Common understory species include false huckleberry, huckleberry, grouse whortleberry, spiraea, beargrass, woodrush, arrowleaf groundsel and Sitka valerian. Closer to the treeline, the trees become stunted, forming krummholz forests with more open overstories. Some areas contain mainly subalpine fir, spruce and whitebark pine, while others contain stunted lodgepole pine. These treeline communities often have shrubby understories, or large herbaceous meadows interspersed throughout the area. The forests eventually transform into talus slopes, scree slopes, wet meadows, turf communities and fellfields along upper slopes and ridges that are dominated by alpine forbs, grasses and sedges.

Riparian and wetland vegetation grows along the Middle Fork of the Flathead River, numerous lakes in the Middle Fork Valley, and streams and creeks. Vegetation mainly includes black cottonwood, Engelmann spruce, paper birch and aspen in the overstory and willow, alders, red-osier dogwood, mountain maple and horsetail in the understory. A number of small wetlands occur throughout the valley.

Noxious weeds infest 399 acres in the Middle Fork (NPS 2001a). State-listed noxious weeds include spotted knapweed, oxeye daisy, Canada thistle, orange hawkweed, St. Johnswort and sulfur cinquefoil. Nearly 387 acres, or 97%, are in the backcountry.

WILDLIFE

Over 300 species of terrestrial wildlife occupy Glacier National Park, either seasonally or year-round. The vegetation descriptions above also describe wildlife habitat in the park. 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,



USFWS Photo by Milo Burcham

hibernacula, den sites, ecotonal areas, roosts, caves and cliffs are especially significant to many species of wildlife.

The earliest park records suggest that wildlife composition of mammals and birds has changed little since Glacier National Park was established. Many species, particularly those with large home ranges, must leave the park in order to find suitable habitats to meet their seasonal needs. This movement across boundaries makes some species vulnerable to poaching, habitat loss and regulated hunting outside of the park. Two native

ungulate species, the mountain bison (*Bison bison*) and the woodland caribou (*Rangifer tarandus*) disappeared from the area by the 1930s (Martinka 1978). The swift fox (*Vulpes velox*) was historically common throughout the Great Plains and along the eastern border of Glacier National Park (Bailey and Bailey 1918). By 1969, the species was declared extinct in Montana. Several species were also introduced to the park. Known exotic or non-native terrestrial and avian species in the park include the raccoon (*Procyon lotor*), ring-necked pheasant (*Phasianus colchicus*), “wild” turkey (*Meleagris gallopavo*), rock dove (*Columbia livia*), European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*). All species are rare except the starling, and none are widely distributed.

Going-to-the-Sun Road Corridor

The McDonald Valley is unique because it is the widest and deepest valley of any tributary on the west side of the park, and Lake McDonald is the largest lake in the park. Although the climate of this area is a modified north Pacific coast type, topographical influences, including valley-ridge configurations, elevation, lake effect, aspect and exposure, combine to create extreme variations in weather over short distances and consequently, a variety of wildlife habitats (Kuchel 1974). There is ungulate winter range at Lake McDonald and along the Middle Fork of the Flathead River. Resident wolves from the North Fork occasionally range into the McDonald Valley, and in 2001, wolves successfully denned adjacent to Lake McDonald. This new information indicates an expansion of occupied wolf habitat in Glacier National Park. There is year-round habitat for many species of wildlife in the valley, including moose, elk, mule and white-tailed deer, black and grizzly bear, cougar, lynx, fisher, wolverine and marten. The McDonald Valley contains nesting habitat for bald eagles, golden eagles, osprey, pileated woodpeckers and barred owls. Upper McDonald Creek, above the inlet of Lake McDonald, has been identified as the single most important harlequin duck-breeding stream in Montana (Ashley 1998).

There is a major wildlife travel corridor between Apgar and West Glacier. Black bear, grizzly bear, elk, deer, mountain lion, lynx and pine marten have all been observed in this area. Elk use the Apgar area in spring for calving and foraging. Muskrat, beaver, mink, river otters, raptors and waterfowl use the highly productive aquatic and riparian habitats along Lower McDonald Creek. The inlets of Lake McDonald and adjacent areas provide breeding, foraging, roosting and wintering habitat for resident and migrant bald eagles. The outlet of Lake McDonald is an important bald eagle wintering and roosting area. These areas are particularly important in years when the lake surface freezes, because they may still provide open water for eagle foraging (Crenshaw 1985, Crenshaw and McClelland 1989, Yates 1989, McClelland et al. 1994). Lake McDonald is also a staging area for harlequin ducks, common loons and numerous other waterfowl.

The mountain goat is the most common large mammal in the area of Sperry Chalet. Mountain goats have become habituated to visitor activity at the chalets and often wander among the guests and facilities. Columbian ground squirrels, red-tailed chipmunks, red squirrels, deer mice, snowshoe hares and mule deer are also common in the area. During the summer, grizzly bears are often attracted to the riparian habitat along Sprague Creek, approximately one-half mile below Sperry Chalet.

Black bears and grizzly bears often feed in the marshy valleys surrounding Granite Park Chalet. Mountain goats and bighorn sheep are also frequently seen along the trail leading from Logan Pass to the chalet and occasionally in the immediate vicinity of the chalet facilities. Other mammals that are common to the area include Columbian ground squirrels, hoary marmots, mule deer, golden-mantled ground squirrels, red-tailed chipmunks and red squirrels. Wolverine, mountain lion, lynx and marten also occur in the general area of Granite Park Chalet.

Wildlife habitat along the east front is particularly diverse because the east side of Glacier National Park is in a transition zone between the Northern Rocky Mountain and Northern Great Plains ecosystems, and between the sharply different Pacific Maritime and Continental climates. The St. Mary Valley, including the Rising Sun developed area, 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. Bald and golden eagles, northern goshawks, harlequin ducks, Cooper's hawks and pileated woodpeckers all nest in the valley. The east side of the park provides excellent winter range for bighorn sheep and mountain goats because the strong winds and sparse vegetation leave the south facing slopes relatively free of snow in winter. Bighorn sheep and mountain goats winter in the St. Mary Valley in the vicinity of Rising Sun, often foraging above the Going-to-the-Sun Road. Important elk calving areas border the St. Mary Campground and the Rising Sun developed area.

The St. Mary elk herd, the largest elk herd in the park, has historically spent most winters (excepting the harshest) inside the park in the St. Mary Valley. More recently, elk have been leaving the St. Mary Valley in late fall to winter on the plains east of the park because of increasing habitat security on the Blackfoot Reservation. An important spring elk calving area is just east of the St. Mary Campground, and each year the Blackfoot Tribal Fish and Game Department closes access to the area to protect the elk from human disturbance at this sensitive time. Elk calving also occurs in the park between Rising Sun and the St. Mary Campground. In summer, the St. Mary elk herd disperses along the east side of the park from Marias Pass north to the Canadian border. Wolves have been detected in the St. Mary Valley in winter. Denning has not been documented since wolves were eradicated from the St. Mary Valley in the late 1800s, but pack activity has been observed in recent years.

In the Apgar Village developed area, Lower Lake McDonald is an important area for wildlife diversity. The outlet of Lake McDonald is a very important area for bald eagle winter foraging and roosting. It is also an important area for harlequin ducks, common loons and numerous other waterfowl. Several species of wildlife use the area just south of the Apgar Village developed area as a travel corridor. Species such as black bear, grizzly bear, lynx, gray wolf, elk, white-tailed deer and wolverine, are known to travel through this area.

Many areas in and around the Lake McDonald developed area are used by wildlife. This locale contains several bald eagle roosting and foraging areas. Many waterfowl species, including common loons and harlequin ducks use Lake McDonald as an important staging area. Harlequin ducks are also frequently seen during spring along the lower portion of Snyder Creek. There is a grizzly bear travel corridor immediately east of the developed area across Going-to-the-Sun Road. Going-to-the-Sun Road crosses the Continental Divide at Logan Pass (elevation 6,646 feet), and the alpine and subalpine habitats traversed by Going-to-the-Sun Road are important for grizzly bears, lynx, golden eagles, bighorn sheep, mountain goats and wolverines.

Two Medicine

The Two Medicine area provides year-round habitat for grizzly bears and a wide range of other wildlife from elk, moose and deer to forest predators such as wolverine, marten, black bears, northern goshawks and lynx. Avalanche chutes, stream bottoms, wet meadows and burns are very productive areas that provide essential spring and fall grizzly bear habitat.

The Two Medicine drainage also contains critical fall, winter and spring habitat for bighorn sheep, mountain goats and other ungulates. There is nesting habitat in the area for bald eagles, golden eagles, common loons, harlequin ducks and other rare and sensitive bird species. Lynx have been frequently

sighted in the valley and family groups have been observed on several occasions. Habitat diversity in the Two Medicine area is quite high due to the combination of grasslands, aspen parklands, conifer forest, riparian woodlands, subalpine shrublands and alpine plant communities. Wolves have been observed in the area, but denning has not been documented.

A study of grizzly bear habitat use in the Two Medicine drainage indicates that visitor activities overlap significantly with grizzly bear use (Baldwin et al. 1985). Trails and campgrounds in the drainage are located in habitats that are of the highest value to grizzly bears, such as lakeshores and riparian corridors. Although grizzly bears concentrate their activity in these essential habitats when human use is lowest (during the early morning, evening and night), encounters between bears and humans frequently occur (Baldwin et al. 1985). An important grizzly bear and bighorn sheep travel corridor is at the foot of Two Medicine Lake adjacent to the developed area and campground.

Many Glacier

The Many Glacier area is a crossroads for wildlife because it is located where three valleys meet and contains outstanding year-round habitat for numerous wildlife species, including grizzly bears, lynx, wolverine, bighorn sheep, mountain goats, elk, moose, white-tailed deer, mule deer and golden eagles. Endangered gray wolves use the area during spring and fall and less frequently during summer and winter. Wolf denning has not been documented in the area. Numerous avalanche chutes and shrubfields provide important grizzly and black bear habitat in spring, summer and fall. Highly productive riparian woodlands, sedge meadows and other wetlands are habitats for countless species in the area, including bears, moose, deer, small mammals, songbirds, fisher, marten, mink, beaver, bats, amphibians and raptors. The drainage contains critical winter and spring range for bighorn sheep as well as lambing and rutting grounds. Several bighorn sheep migration corridors that have probably been in continual use for over 4,000 years go across the drainage, providing connectivity between seasonally important habitats.

The Many Glacier area's remoteness and relative lack of human activity during the winter provides undisturbed habitat for uncommon species, such as lynx, marten, wolves, fisher and wolverine. These five species are at low densities and are difficult to observe and study in summer. Consequently, very little is known about their specific summer habitat use and requirements. There has been documentation of family groups of both lynx and wolverine in the Many Glacier drainage in recent years. Available denning habitat, diverse and healthy ungulate populations and much terrain that is inaccessible to humans (especially in winter and late spring) make the Many Glacier drainage a highly suitable wolverine habitat.

Large parts of the drainage are in the alpine zone and contain steep talus fields and cliff bands. The areas provide habitat for mountain goats and cliff-nesting raptors, such as golden eagles and prairie falcons. Isolated, forested mountain ridges provide secure habitat for large herds of elk throughout the spring, summer and fall. Bald eagles frequent the lakes in the drainage, but nesting has not been documented. The Sherburne Dam, built in 1919, inundated several small lakes, the reaches of Swiftcurrent Creek and highly productive riparian/wetland areas. Today, the area surrounding Lake Sherburne Reservoir supports little vegetation because of fluctuating water levels and is used infrequently by wildlife.

Several documented wildlife corridors cross the developed area at Many Glacier. Wolverine, grizzly bears, gray wolves and lynx, among other wildlife, use these corridors. A bighorn sheep route crosses directly behind the Many Glacier Hotel and is often used by bighorn sheep in the fall and spring to reach secure lambing and rutting areas. In addition to being an important wildlife movement corridor,

the Many Glacier developed area has critical bighorn sheep winter range. The lack of human activity in the winter at Many Glacier encourages shy species like lynx, marten, fisher and wolverine to use habitat in the developed area during that time. Very little is known about their specific habitat use and requirements in the area in summer. Grizzly bears are known to use the developed area for travel and foraging.

The Many Glacier Valley floor is narrow and contains several large lakes. There is north-south movement of many species of wildlife in the limited forested areas between the lakes, including the Swiftcurrent developed area. Grizzly bears, bighorn sheep, lynx, wolverine, elk and moose are known to use the wildlife corridors in and around the Swiftcurrent developed area. The open grassland slopes of Mt. Altny are important fall, winter and spring range for bighorn sheep and mountain goats. Sheep lambing also occurs in the area. Grizzly bears use all of the Many Glacier Valley during spring, summer and fall, including parts of the Swiftcurrent developed area. Numerous lynx and wolverine have been documented in and around the developed area year-round. Golden eagles nest on cliffs next to the developed area, and northern goshawks have been documented in the area.

Goat Haunt-Belly River

The Goat Haunt-Belly River area contains habitat for large populations of elk, moose, bighorn sheep and deer. Mountain goats are common in the higher elevations, and raptors, including golden eagles and prairie falcons, regularly nest in cliffs throughout the area. Bald eagles also nest in old-growth vegetation next to lakes in both the Waterton and Belly River drainages. The last wolf pack to den in Glacier National Park, prior to the eradication of the species in the early part of the 20th century, denned in the Belly River Valley. There is regular pack activity in the area, but denning has not been confirmed. The area has habitat for grizzly and black bears, mountain lions, lynx, wolverine, fisher and marten. Common loons and harlequin ducks have historically nested in the area.

North Fork

The North Fork area provides critical winter range for most ungulate species in the park except for bighorn sheep. The year-round presence of diverse ungulate populations in the valley makes the North Fork an ideal place for large and mid-sized carnivores, including gray wolves, grizzly bears, black bears, mountain lions, bobcats, coyotes and lynx. The first documented denning of wolves in Glacier National Park in 50 years took place in the North Fork Valley in 1986 (Ream et al. 1991). Most large lakes in the North Fork support nesting pairs of bald eagles, osprey and common loons. Common loons in the North Fork have the highest reproduction rate of loons anywhere in the park. Wide-ranging wildlife species such as grizzly bears, wolves and elk, often leave the park and fulfill many of their needs on land managed by other entities, including the Flathead National Forest, the State of Montana, British Columbia's Provincial government and private landowners. This movement across boundaries may expose the species to poaching, habitat loss and regulated hunting outside of the park.

Middle Fork

Due to remote access, there is limited information about wildlife use in the Middle Fork area. Wildlife use of areas along U.S. Route 2 and the Middle Fork of the Flathead River is better understood. A prominent mineral lick along the Middle Fork of the Flathead near Walton draws mountain goats from a wide geographic area, especially in spring and early summer. The Belton Hills near West Glacier have important winter range for large numbers of deer and elk. A pair of bald eagles has nested successfully near Nyack Creek, far from the corridor of the Middle Fork of the Flathead River where float trips occur. Lynx were historically present throughout the Middle Fork, but systematic surveys have only recently detected this uncommon carnivore in the area. However, surveys on the nearby

Flathead National Forest have documented evidence of continued occupation by lynx. Grizzly bears, mountain lions, wolverine and gray wolves also occupy the Middle Fork, indicating the presence of healthy ungulate populations in the area. Harlequin ducks breed in streams in the Middle Fork.

AQUATIC RESOURCES

The headwaters of three continental drainages start in Glacier National Park. The Columbia River basin, the area west of the Continental Divide, is a complex network of unique streams and lakes with high water volumes, low productivity, cold temperatures and high clarity.



USNPS Photo

The Missouri River drainage, in the southeast part of the park, has low productivity lakes and streams and a significantly different fish species make-up than the Columbia River basin. Much of this drainage in the park is thought to have been originally barren of fish, although westslope cutthroat trout, mountain whitefish and longnose suckers are known to be indigenous to the drainage.

The Saskatchewan River drainage flows north to Hudson Bay. The headwaters, which are in the northeast area of the park, are low in productivity. Both native and non-native species occupy the lakes and streams of this drainage.

The aquatic ecosystem in Glacier National Park has 17 native and seven non-native fish species. The natural aquatic systems and associated indigenous fisheries of the park were dramatically altered in the last century by the introduction and invasion of non-native fish, such as lake trout, eastern brook trout and rainbow trout. Although all of the native species are still in the park's lakes and streams, species composition and their relative numbers have changed significantly. The stocking of non-native sport fish in park waters began in 1912, peaked between 1920-1955, and stopped in 1972. During that time, several species of non-native salmonids became established in park waters.

The altered fish communities' effects on their associated amphibian, aquatic invertebrate and terrestrial vertebrate populations are not easily described due to a lack of historic data. Park managers are concerned that changes in the abundance of native fish may negatively affect the native predators that depend on them (e.g. bald eagles, river otters, osprey, etc.). Although fish are not currently stocked in the park's waters, the introduction and invasion of non-native fish species have seriously compromised the park's aquatic systems (Marnell 1988). As aquatic and terrestrial habitats outside the park become more degraded, and as inbreeding with non-native species becomes more prevalent, headwater parks like Glacier National Park become increasingly important as refuge for pure genetic stocks of fish.

In addition to the ichthyofauna of the park's lakes and streams, the park is also home to many amphibious and aquatic invertebrates, vertebrates and macroinvertebrates. Long-toed salamanders (*Ambystoma macrodactylum*), tailed frogs (*Ascaphus truei*), boreal toads (*Bufo boreas*), Pacific tree frogs (*Pseudacris regilla*), Columbia spotted frogs (*Rana luteiventris*) and painted turtles (*Chrysemys picta*) are all closely associated with the park's aquatic systems. Also, U.S. Geological Survey researchers found a new frog species, the boreal chorus frog (*Pseudacris maculata*) in the park near East Glacier in 2001. The introduction of non-native sport fish has been implicated in the decline of several amphibian species in North America. Sport fish have been introduced in numerous, formerly

fishless lakes in Glacier National Park, but the impact on native amphibians in the park is not well understood due to the lack of historic distribution data (Marnell 1997). The absence of amphibian breeding sites in waters with fisheries suggests that fish introductions may have locally impacted park amphibian populations (Marnell 1997). In the last ten years, extensive amphibian surveys have been conducted throughout the park's backcountry by U.S. Geological Survey researchers. Current distributions are fairly well understood, but population status and trends are not. Amphibian habitat in the park's developed areas has not been surveyed well. Although primary surveys on amphibians and localized studies of macroinvertebrates have been done, comprehensive information on these organisms is not currently available.

Going-to-the-Sun Road Corridor

In the Going-to-the-Sun corridor there are 11 known native fish species, six known non-native fish species and many aquatic invertebrate, vertebrate, or macroinvertebrate species. The half of the Going-to-the-Sun Road corridor that is on the west side of the Continental Divide is in the Columbia River basin. This area has 11 native fish species (westslope cutthroat trout, bull trout, mountain whitefish, pygmy whitefish, redbelt shiner, peamouth, northern pike minnow, longnose sucker, largescale sucker, slimy sculpin and shorthead sculpin) and six non-native fish species (rainbow trout, eastern brook trout, Yellowstone cutthroat, kokanee salmon, lake whitefish and lake trout). The area also has long-toed salamanders, tailed frogs, boreal toads, Pacific tree frogs, Columbia spotted frogs and painted turtles. The half of the Going-to-the-Sun Road corridor that is on the east side of the Continental Divide is in the South Saskatchewan River drainage. There are 10 native fish species (westslope cutthroat trout, bull trout, mountain whitefish, lake whitefish, lake trout, longnose sucker, spoonhead sculpin, burbot, northern pike and trout perch) and two non-native fish species (brook trout and Yellowstone cutthroat trout) in the Going-to-the-Sun Road corridor east of the Continental Divide in Glacier National Park.

The Apgar Village area is at the foot of Lake McDonald in the McDonald Creek drainage of the Columbia River basin. In the aquatic ecosystem of Lake McDonald, there are 11 native and five non-native species of fish. Native species include westslope cutthroat trout, bull trout, mountain whitefish, pygmy whitefish, redbelt shiner, peamouth, northern pike minnow, longnose sucker, largescale sucker, slimy sculpin and shorthead sculpin; non-native species include rainbow trout, eastern brook trout, kokanee salmon, lake whitefish and lake trout. The natural aquatic system and associated indigenous fish make-up of Lake McDonald has been seriously changed in the last century by the introduction and invasion of non-native fish, such as lake trout and lake whitefish. Although all of the native species are still in the lake and Lower McDonald Creek, species composition and relative numbers have changed dramatically. Stocking of non-native species in Lake McDonald began around 1912 and ended in the late 1960s.

The Lake McDonald drainage area also contains many amphibious and aquatic invertebrates, vertebrates and macroinvertebrates. Amphibian habitat in the Apgar Village developed area has not been surveyed well and although there have been primary surveys on amphibians and localized studies of macroinvertebrates, comprehensive information on them is not currently available. Long-toed salamanders, tailed frogs, boreal toads, pacific tree frogs, Columbia spotted frogs and painted turtles have all been found in the area.

Like the Apgar Village area, the Lake McDonald developed area is located on Lake McDonald in the McDonald Creek drainage of the Columbia River basin. See the Apgar Village area discussion above for a description of the aquatic ecosystem of Lake McDonald.

The Lake McDonald developed area is also home to many amphibious and aquatic invertebrates, vertebrates and macroinvertebrates. There is not a complete survey of the amphibian habitat in the Lake McDonald developed area. Although there have been primary surveys on amphibians and localized studies of macroinvertebrates, comprehensive information on the organisms is not currently available. Long-toed salamanders, tailed frogs, boreal toads, pacific tree frogs, Columbia spotted frogs and painted turtles have all been found in the area.

The Rising Sun developed area is located immediately next to Rose Creek in the St. Mary drainage. In the aquatic ecosystem of Rose Creek, there are no known native fish and two non-native fish species (eastern brook trout and cutthroat trout). Because of the numerous natural waterfalls and cascades on Rose Creek, most of the drainage, including Otokomi Lake, was historically fishless. Although there are no records indicating that native fish used the lower reaches of Rose Creek, it is likely that some native fish from St. Mary Lake used them for spawning and rearing juvenile fish. Between 1923 and 1935, cutthroat trout were stocked in Otokomi Lake and still inhabit the lake today. Stocking non-native fish in Otokomi Lake has probably had an impact on the aquatic life in this system; however, no research has been done to document the effects of this introduction.

Many amphibious and aquatic invertebrates, vertebrates and macroinvertebrates also inhabit the St. Mary drainage area. Amphibian habitat in the Rising Sun developed area has not been surveyed well. Although primary surveys on amphibians have been done, comprehensive information on these organisms is not currently available. Columbia spotted frogs, boreal toads and long-toed salamanders have all been found in the St. Mary drainage.

Two Medicine

The Two Medicine area is in the Missouri River drainage. Much of this drainage in the park is thought to have been originally fishless, although westslope cutthroat trout, mountain whitefish and longnose sucker are known to be indigenous to the drainage. Ichthyofauna, Columbia spotted frogs, tailed frogs and boreal toads have been found in the Missouri River drainage in the park.

The Two Medicine developed area is near the foot of Two Medicine Lake in the Two Medicine Creek drainage, which is believed to have been historically fishless. There are no known native fish species present. Stocking records indicate that non-native fish introductions began in 1914 in Upper Two Medicine Lake and in 1919 in Two Medicine Lake, where it continued until 1969. Three non-native fish species currently inhabit Two Medicine Lake (eastern brook trout, rainbow trout and sculpin).

The Two Medicine Lake area also has many amphibious and aquatic invertebrates, vertebrates and macroinvertebrates. Amphibian habitat in the Two Medicine developed area has not been surveyed well. Although primary surveys on amphibians and localized studies of macroinvertebrates have been done, there is presently no comprehensive information on these organisms. Columbia spotted frogs, tailed frogs and boreal toads have been found in the Missouri River drainage in the park.

Many Glacier

The Many Glacier area is located in the South Saskatchewan River drainage. There are no native fish and two known non-native fish (eastern brook trout and kokanee salmon) in this area in the park. The area also has Columbia spotted frogs, boreal toads and long-toed salamanders.

The Many Glacier developed area is on the east shore of Swiftcurrent Lake in the Swiftcurrent Creek drainage. In the aquatic ecosystem of Swiftcurrent Lake, there are no native fish and two known non-native fish species (eastern brook trout and kokanee salmon). The Swiftcurrent Creek drainage was

historically fishless down to Swiftcurrent Falls at the outlet of Swiftcurrent Lake. The introduction of non-native sport fish such as rainbow and eastern brook trout has seriously changed the natural aquatic system in the last century. Stocking non-native fish in Swiftcurrent Lake began in 1912 and continued until 1966. Stocked species included non-native rainbow, brook and cutthroat trout, grayling and kokanee salmon.

The Swiftcurrent Creek drainage area also has many amphibious and aquatic invertebrates, vertebrates and macroinvertebrates. There is no complete survey of amphibian habitat in the Many Glacier developed area. Although primary surveys on amphibians have been done, comprehensive information on these organisms is not currently available. Columbia spotted frogs, boreal toads and long-toed salamanders have all been found in the Swiftcurrent Creek drainage.

Although the Swiftcurrent developed area boundaries do not include any major streams or lakes, the area is close to a number of important waterways. The Swiftcurrent developed area is bounded by Wilbur Creek to the west and Swiftcurrent Creek to the south. In the aquatic ecosystem of Wilbur and Swiftcurrent Creeks, there are no known native fish and one non-native fish (eastern brook trout). The Swiftcurrent and Wilbur Creek drainages were historically fishless above Swiftcurrent Falls. The impact of years of stocking non-native fishes into the area waters has probably had a major effect on native plants and animals in these waters.

The Swiftcurrent and Wilbur Creek drainages also have many amphibious and aquatic invertebrates, vertebrates and macroinvertebrates. Amphibian habitat in the Swiftcurrent developed area has not been surveyed well. Although primary surveys on amphibians have been done, there is no available comprehensive information on these organisms. Columbia spotted frogs, boreal toads and long-toed salamanders have all been found in the Swiftcurrent and Wilbur Creek drainages.

Goat Haunt-Belly River

The Goat Haunt-Belly River area is in the Hudson Bay drainage. In the aquatic ecosystem of the Hudson Bay drainage, there are nine native fish species (westslope cutthroat trout, bull trout, mountain whitefish, lake trout, longnose sucker, spoonhead sculpin, burbot, northern pike, trout/perch) and six non-native fish species (rainbow trout, eastern brook trout, Yellowstone cutthroat trout, kokanee salmon, lake whitefish, arctic grayling). The natural aquatic system and associated native fishes of the Hudson Bay drainage have been seriously altered in the last century by introduction and invasion of non-native fish, such as rainbow trout and eastern brook trout. Although all of the native species still inhabit various lakes and creeks in the drainage, species composition and relative numbers have changed dramatically. Stocking non-native species in the drainage in the park began around 1912 and ended in the late 1960s.

In addition to the ichthyofauna of the Hudson Bay drainage, this area also has many amphibious and aquatic invertebrates, vertebrates and macroinvertebrates. Long-toed salamanders, Columbia spotted frogs and boreal toads have all been found in the Hudson Bay drainage.

Middle Fork

The Middle Fork area is in the Middle Fork of the Flathead River drainage in the Columbia River basin. There are 11 native fish species in the area (westslope cutthroat trout, bull trout, mountain whitefish, pygmy whitefish, redbelt shiner, peamouth, northern pike minnow, longnose sucker, largescale sucker, slimy sculpin, shorthead sculpin) and six non-native fish species (rainbow trout, eastern brook trout, Yellowstone cutthroat trout, kokanee salmon, lake whitefish, lake trout). The

natural aquatic system and associated native fishes of this drainage have been seriously altered in the last century by the introduction and invasion of non-native fish such as lake trout and lake whitefish. Although all of the native species still inhabit various lakes and creeks in the drainage, species composition and relative numbers have changed dramatically. Stocking non-native species in the drainage in the park began around 1912 and ended in the late 1960s.

In addition to the ichthyofauna of the Middle Fork drainage, this area also has many amphibious and aquatic invertebrates, vertebrates and macroinvertebrates. Long-toed salamanders, tailed frogs, boreal toads, pacific tree frogs, Columbia spotted frogs and painted turtles all inhabit the Middle Fork of the Flathead River drainage.

THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN

According to the Endangered Species Act of 1973, the term “endangered species” means any species that is in danger of extinction throughout all or a significant part of its range. A “threatened species” is any species that is likely to become an endangered species in the foreseeable future throughout all or a significant part of its range.

Species of concern to Glacier National Park are species that are rare, endemic, disjunct, vulnerable to eradication, in need of further research, or likely to become threatened or endangered if limiting factors are not reversed. A species may also be of concern because of characteristics that make it particularly sensitive to human activities or natural events. The species of concern list for Glacier National Park includes species that are listed as “species of special concern” by the Montana Natural Heritage Program, “priority species” by Montana Partners in Flight and “sensitive species” by the Flathead National Forest. Species of concern may also include big game, upland game birds, waterfowl, carnivores and furbearers whose populations are protected in the park but are vulnerable to hunting and trapping outside of the park.



USFWS Photo

Federally and State Listed Wildlife Species Including Aquatic Species

Five wildlife species listed as threatened or endangered by the Fish and Wildlife Service inhabit Glacier National Park. They are the threatened bald eagle, grizzly bear, lynx and bull trout, as well as the endangered gray wolf. Sixty-five wildlife species have been identified as “species of concern.”

Following is a description of each of the five federally listed wildlife species in the park.

- **Bald Eagle (*Haliaeetus leucocephalus*)**
The bald eagle was proposed for removal from its threatened status in July 1999, but a final decision and ruling by the Fish and Wildlife Service is pending. If the bald eagle is removed from the threatened species list, it will continue to be closely monitored for a period of five to 20 years and will still be protected under the Migratory Bird Treaty Act (1918) and the Bald Eagle Protection Act (1940).

Bald eagles use parts of Glacier National Park on a year-round basis for nesting and wintering (Yates 1989) and seasonal migration (McClelland et al. 1994, Yates et al. 2001). Glacier National Park is in a major bald eagle migration corridor, and their use of it along the western side of the park has been extensively documented (McClelland et al. 1994). Some eagles stay to forage near Lake McDonald and winter in the area, especially along the Middle and North Forks of the Flathead River.

The *Montana Bald Eagle Management Plan* (Montana Bald Eagle Working Group 1994) provides guidance for conservation and management of bald eagles and their habitat in Montana. It is an extension of the *Pacific States Bald Eagle Recovery Plan* (USFWS 1986) developed by the U.S. Fish and Wildlife Service and furnishes information for landowners and resource managers about the biology of the eagles. It provides general guidelines for use in lieu of site-specific data and for management based on minimal human disturbance. It identifies nest site management zones and recommends various levels of protection in nesting territories. In addition, Glacier National Park's *Bald Eagle Operational Plan and Habitat Management Guidelines* (NPS 1999b) contains site-specific information and outlines actions for habitat management to protect and perpetuate areas used by bald eagles in the park.

The productivity of the park's nesting bald eagle population is generally less than half that of the productivity documented for the rest of Montana (NPS files) and is considered to be extremely low. This productivity is also about half of the level recommended in the *Pacific States Bald Eagle Recovery Plan* (USFWS 1986) for maintaining viable populations of nesting bald eagles. Lower productivity in the park may be caused by severe winter and spring weather, deterioration of native fisheries (and consequently, prey species), and/or human disturbance near nesting and foraging sites.

Nesting habitat characteristics include old-growth forest types near water, where there is some seclusion from human activity. Many nest sites are located near lake inlets where foraging for fish is productive, and bald eagle nesting sites occur primarily along the margins of lakes and along the larger rivers in the park. Vegetative screening provides much of the necessary seclusion for eagles near nesting, roosting, foraging, and feeding areas (Caton et al. 1992). Nest areas are especially critical, because human activity or development may stimulate abandonment of the breeding area, and affect successful completion of the nesting cycle, thereby reducing productivity. Designated nest site management areas help to eliminate human disturbance and maintain or enhance nest site habitat suitability.

Designated nest site management areas extend to a 1/4-mile radius of all nest sites that have been active within five years. The bald eagle nesting season in Glacier National Park extends from early March through late September. Human activity is restricted within 1/4 mile of bald eagle nesting, roosting, and primary foraging areas during specific stages of the nesting cycle. Those stages include courtship (late February to mid-April); egg laying and incubation (late March to late May); nestling (mid-May to mid-August); and fledging (early August to late September—the least sensitive period). The potential for nest failure and nestling death due to human disturbance is reduced, but not eliminated, after nestlings reach an age of four weeks (usually early to late June in the park). Nestlings usually fledge at 10 to 12 weeks of age (by mid-August), but young eagles do not migrate from breeding areas until sometime between mid-September and early October (McClelland et al. 1996). Human activity can negatively impact nesting success during this period as well.

Preferred wintering habitat is also usually near open water where fish are available and waterfowl congregate, or near a concentrated food source such as ungulates killed by predators or road accidents. In addition to food, eagles require large trees and freedom from disturbance for feeding and roosting in winter. Lake McDonald is the primary wintering area in the park that is affected by this commercial services plan. Some winter use has also been documented in the Two Medicine Valley, but it may be early nesting activity by resident eagles.

While roosting habitat is usually associated with large trees near a concentrated food source (Keister 1981, Crenshaw 1985), foraging habitat typically consists of lake inlets and outlets, shallow lakes, streams, rivers, wetlands, and meadows or any area where dead prey is available. Roost and foraging areas also provide open flight paths, perches, and security from intrusions and other disturbances. Documented roost areas affected by this plan are located near Lake McDonald (Crenshaw 1985, Crenshaw and McClelland 1989).

Foraging habitat outside of nest site management zones is also important, especially for non-breeding, wintering, and migrant bald eagles (Montana Bald Eagle Working Group 1994). Non-breeding eagles are often excluded from preferred foraging areas by nesting bald eagles, and extensive foraging flights by breeding adults may expand well beyond the 2.5-mile radius, or home range zone as described in the Montana Plan (Yates 1989). The quality, amount, and proximity of foraging habitat influence the overall population of bald eagles, in addition to the breeding adults. Bald eagle foraging and wintering habitats are found throughout Glacier National Park, and are generally associated with large lakes and rivers.

- Grizzly Bear (*Ursus arctos*)

Glacier National Park is the central recovery area for the threatened grizzly bear in the Northern Continental Divide Ecosystem. A recent study using sign surveys and DNA fingerprinting resulted in a preliminary estimate of 270-320 grizzly bears in Glacier National Park (K. Kendall, U.S. Geological Survey [USGS], pers. comm.). Exact population estimates and trends are difficult to establish due to the lack of intensive population research in the park 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 2000a) are guidelines for the management of grizzly bears in Glacier National Park. The plans outline actions that are required to protect and recover the federally listed grizzly bear. In the Northern Continental Divide Ecosystem Grizzly Bear Management Area, one recovery standard is the population goal, which is based on the annual number of unduplicated observations of females with cubs-of-the-year. In Glacier National Park, the target is 10 females with cubs-of-the-year. Observations in the park are summarized from the park's Bear Information Management System database, and recent counts in the park have been near or below the identified target (GNP files).

Grizzly bears need large areas of undeveloped habitat (including a mixture of forests, moist meadows, grasslands, and riparian habitats) and have home ranges of 80 to 800 square miles (USFWS 1993). A radio-collared, female grizzly with cubs was documented using 137 square miles as a home range in 1998 and 1999 in the Lower McDonald Valley of Glacier National Park (NPS 1999b). Grizzly bear seasonal movements and habitat use are related to the availability of different food sources. In spring, grizzly bears feed on dead ungulates and early greening vegetation at lower elevations (Martinka 1972). During the summer, some bears move to higher elevations to search for glacier lilies and other roots, berries, and army cutworm moths (*Euxoa auxiliaris*) (White et al. 1998). During the huckleberry (*Vaccinium sp.*) season, bears often

concentrate in the Apgar Mountains (Kendall 1986), Belton Hills, Snyder Ridge, the Many Glacier Valley, the Two Medicine Valley, and other areas. Avalanche chutes are 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, usually at higher elevations on steep slopes where there is an accumulation of deep snow (Mace and Waller 1997). Recent evidence indicates that in the North Fork of the Flathead River drainage, some bears do not den for the entire winter or may den for shorter periods than elsewhere. This might be due to an abundance of predator-killed ungulates (Ruth and Gniadek 1996).

Besides diverse foraging habitat, grizzly bears require natural habitat with travel corridors between foraging sites. Examples of these types of travel corridors are found in the McDonald Valley near Apgar and along Lake McDonald, in the Two Medicine Valley adjacent to the campground, and in the Many Glacier Valley near the Swiftcurrent Motor Inn and Many Glacier Hotel. Grizzlies are wide-ranging and require a substantial amount of solitude from human interactions (Brown 1985).

Grizzly bear/human interaction is a management concern that can threaten the safety of visitors as well as that of wild bears. Bears that are familiar with humans may become used to human presence and attracted to visitor use areas. Frequenting human use areas may further accustom bears to the presence of people and will increase the risk of contributing to bear/human encounters. There is a great risk that such habituated bears will become conditioned to food and may aggressively look for human food at developed areas. Habituated bears are usually relocated or hazed from developed areas, and food-conditioned bears are often removed from the population. There is evidence that females with cubs are more susceptible to habituation and food conditioning due to habitat partitioning and the food demands on them (Mattson et al. 1987). Because of this condition, females with cubs are often in the neighborhood of quality habitat nearer developed and human use areas.

- Canada Lynx (*Lynx canadensis*)

On April 24, 2000, the Canada lynx was listed as a threatened species in the adjacent United States. The U.S. Fish and Wildlife Service concluded that the population was threatened by human alteration of forests, past overexploitation that diminished its numbers, growth of the range of its competitors, and more human access into lynx habitat. To date, critical habitat for the species has not been designated or proposed (USFS and USFWS 2000).

Lynx habitat is generally described as climax boreal forest with a dense undercover of thickets and windfalls (Ruediger et al. 2000). Lynx often prefer advanced successional stages of forests and dense conifer stands for denning and foraging, respectively. Large amounts of woody debris and



USBLM Photo

minimal human disturbance are important to denning sites (Brittell et al. 1989). Lynx generally forage in young conifer forests, especially where their primary prey, snowshoe hare (*Lepus americanus*), is abundant. Older forests with a dense understory also provide good foraging habitat, and are often more stable sources of snowshoe hares than younger, transitory forests (Ruediger et al. 2000). Travel corridors are thought to be an important factor in lynx habitat because of their large and variable home ranges, generally 10 to 147 square miles (Ruediger et al. 2000). Travel cover includes contiguous vegetation cover over 6 feet tall (Brittell et al. 1989), and lynx usually do not cross openings more than

330 feet wide (Koehler 1990). Lynx are most susceptible to disturbance during the denning period and while newborns are developing (May–August) (Joslin and Youmans 1999). Potential lynx habitat has not been described in Glacier National Park due to the lack of information about vegetation and snow cover. Deciduous and coniferous forests cover approximately 55% of Glacier National Park, but an unknown percentage of forested habitats could be potential lynx habitat (GNP files).

Simultaneously with the listing process, a national interagency Canada Lynx Conservation Assessment and Strategy was developed to provide a consistent and effective method for conserving the species. All federal land management agencies, including the National Park Service, were participants. This strategy identifies 17 risk factors that could adversely affect lynx mortality, productivity, and movements (Ruediger et al. 2000). In Glacier National Park, the primary risk factors for lynx are: wildland fire management policies that alter the frequency and extent of natural disturbance processes, roads and highways, winter recreational trails, and habitat degradation by non-native invasive plant species. Incidental or illegal shooting and trapping, competition or predation influenced by human activities, and human developments that degrade and fragmented lynx habitat are also risk factors.

Lynx were considered more-or-less common throughout the Glacier Park region during the early 1900s (Bailey 1918). Reported lynx sightings declined after the 1960s, but have increased in recent years, possibly due to increased interest in the species (GNP files). Systematic lynx surveys involving snow tracking and DNA sampling were initiated in 1994 and 1999; 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 were made. Remote camera stations and winter tracking have also documented family groups in the Many Glacier and Two Medicine Valleys.

- Bull Trout (*Salvelinus confluentus*)

The Fish and Wildlife Service under the Endangered Species Act has given threatened status to bull trout in both the Upper Columbia River Basin and the Hudson Bay drainage. Glacier National Park contains a large amount of lake and stream habitat for bull trout in the North Fork and Middle Fork of the Flathead River drainages and parts of the Hudson Bay drainage. River and lake systems in the Missouri River drainage in Glacier National Park do not contain bull trout.

Bull trout exhibit three distinct life history forms: resident, fluvial, and adfluvial. Resident bull trout spend their entire lives in small tributaries, whereas fluvial and adfluvial forms hatch in small tributary streams and then migrate into larger rivers (fluvial) or lakes (adfluvial). Spawning occurs in late August to early November, depending on water temperatures. Eggs and fry usually overwinter in spawning streams until the following spring. The specific habitat requirements of bull trout include abundant cover for adult fish during spawning, low levels of fine sediment in the incubation environment, cold summer water temperatures and channel stability for juveniles, and open migration routes between habitats that are important for each season (USFWS 1998).

There has been a large drop in the population of bull trout in the Lake McDonald/Flathead drainage. The major threat to the development of the bull trout population in Lake McDonald and the Flathead system is competition and hybridization with introduced, non-native fish species such as lake trout and eastern brook trout. Other threats include blocked migration routes (Hungry Horse Dam) and past over-harvest by anglers. Present fishing regulations prohibit the taking of any bull trout in both Glacier National Park and the state managed Flathead drainage system.

By the 1950s, wolves were virtually absent from the lower 48 states.

The main threat to bull trout persistence west of the Continental Divide in Glacier National Park is the invasion of non-native lake trout into bull trout habitat. Historic records do not show that lake trout were ever stocked in the Flathead drainage in the park. However, because of immigration from downstream areas as early as 1959, the species became established in most of the park's larger lakes, including Lake McDonald (Fredenberg 2000). When non-native lake trout are introduced into a natural system dominated by bull trout, the lake trout usually displace bull trout because of competition and predation (Donald and

Alger 1993). Systematic surveys conducted by the Fish and Wildlife Service in 2000 to assess the population status of bull trout in lakes on the park's west side indicate that bull trout populations have steeply declined. Large increases in lake trout were also noted for most lakes including Lake McDonald. The survey report concludes that most of the bull trout populations in the park's lakes "are currently at high risk of extirpation" due to displacement by lake trout. The survey report recommends restoring bull trout in compromised lakes, possibly through a lake trout eradication program, and protecting remaining pristine lake systems from invasion by lake trout in the future (Fredenberg 2000).

- **Gray Wolf (*Canis lupus*)**
Historically common throughout the Rocky Mountains, gray wolves were present but greatly reduced by the time Glacier National Park was established in 1910. Until wolves returned to the park in the 1980s, the park's last known resident wolf pack was removed from the Belly-Waterton River Valleys by a professional Canadian wolfer around 1920. Scattered nomadic pairs and lone wolves were observed throughout the park after 1920, but no resident wolf packs were confirmed (Singer 1975).

By the 1950s, wolves were virtually absent from the lower 48 states. The exception was a small population less than 1,000 in northeastern Minnesota and northern Michigan (USFWS 1987). Wolves in the Northern Rocky Mountains were listed as endangered under the current Endangered Species Act in 1973.

By the 1970s, wolf sightings were becoming more frequent in the North Fork of the Flathead River Valley and there was an effort to monitor wolf activity in and around Glacier National Park. The University of Montana's Wolf Ecology Project was initiated in 1978. Then 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 approximately 10-33 wolves maintained home ranges in the North Fork throughout the 1990s. Recent sightings have noted two packs occupying the North Fork and a third pack in the McDonald Valley area.

In addition to the resident North Fork packs, 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. According to recent sightings and historic records for the east side of the park, wolves are recolonizing the area. Pack activity has recently been observed in the St. Mary, Many Glacier, and Two Medicine Valleys, but the population dynamics of recolonizing wolves are quite variable. Wolf monitoring in Glacier National Park has been reduced since wolf ecology research concluded in 1996.

Gray wolves are wide-ranging and their distribution is tied mainly to their primary prey (deer, elk, and moose). Important components of wolf habitat are: 1) sufficient numbers of prey year-round, 2) suitable and somewhat secluded denning and gathering sites, and 3) sufficient space with minimal exposure to humans (USFWS 1987). Low elevation river bottoms that are relatively free from human disturbance provide important winter range for ungulates and wolves. Wolves are especially sensitive to disturbance at den and gathering sites during breeding. Human activity near den sites can lead to pack displacement or physiological stress that might cause reproductive failure or pup mortality (Mech et al. 1991). Several diseases, including sarcoptic mange, distemper, parvovirus, and hookworm can be transmitted to wolves from domestic dogs and may have severe impacts on the mortality and recruitment of wolves (Joslin and Youmans 1999).

Glacier National Park is part of the northwest Montana Recovery Zone where the *Northern Rocky Mountain Gray Wolf Recovery Plan* directs the management and recovery of wolves (USFWS 1987). The recovery of wolves in the western U.S. is based on the population goal of maintaining at least ten reproducing packs in each of the three recovery zones for three years. Lack of sufficient prey 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). The park's predominantly natural landscape contains some of the most secure and productive wolf habitat in the northwest Montana Recovery Zone. Even with fluctuating wolf numbers since 1986, the park's established wolf population continues to be a source for natural recolonization in northwest Montana and southern Canada (Boyd-Heger 1997).

The wildlife species of concern found in Glacier National Park are described below. The species of concern list for Glacier National Park includes species that are listed as "species of special concern" by the Montana Natural Heritage Program, "priority species" by Montana Partners in Flight, and "sensitive species" by the Flathead National Forest (Bailey 1918).

- Northern bog lemming (*Synaptomys borealis*)
Northern bog lemmings are rare residents of wet meadows, bogs, and marsh borders. They typically inhabit sphagnum bogs and fens, but are also found in mossy forests, wet sub-alpine meadows and alpine tundra. Boreal in distribution, northern bog lemmings occur in North America from near treeline in the north, south to Washington, Idaho, Montana, Minnesota, and New England (Reichel 1995). There are only 16 known populations of bog lemmings in Montana, six of which are located on the west side of the Continental Divide in Glacier National Park, in the McDonald and North Fork drainages (MNHP 2000). The northern bog lemming is rarely trapped and very little is known about its population status and life history. The disjunct nature of Montana's relict populations has generated concern over the viability of the northern bog lemming in the southern portion of its range. Surveys for northern bog lemmings have not been conducted on a park-wide basis, but all sphagnum and fen/bog moss habitat patches are considered suitable habitat and should be preserved to maintain viable populations of northern bog lemmings (Reichel 1995). Breeding has been documented but population trend is unknown.
- Swift fox (*Vulpes velox*)
The swift fox, a house cat-sized mammal that preys mostly on grasshoppers and ground squirrels, was historically common throughout the Great Plains and along the eastern border of Glacier National Park (Bailey and Bailey 1918). Records from fur trade along the Upper Missouri River show that 8,500 swift fox pelts were taken between 1835 and 1838 (Knowles et al. 1998). By 1969, the species was extinct in Montana. Since 1998, annual releases of captive-bred swift foxes from Canada have occurred on the Blackfeet Indian Reservation just east of Glacier National Park as part of a five-year reintroduction program. Survivorship has been high and successful denning

has been observed every year (Schmitt 2000). The population of swift foxes on the Blackfeet Indian Reservation is the only known reproducing population in the state of Montana. Threats to swift foxes are trapping/shooting, deteriorating range conditions, vehicle-caused mortality, rodent control programs, pesticides, and predation by coyotes, which have become unnaturally abundant in the absence of wolves. Swift foxes are rare visitors to the fescue grasslands along the east side of the park. Denning has not been observed in the park, but hunting foxes has been documented. Sightings have occurred in the St. Mary and Cut Bank Valleys (GNP files).

- Fisher (*Martes pennanti*)
Fishers are residents of coniferous forests and riparian areas. Breeding in the park is probable, but the population status and trend are unknown. Fisher were probably eliminated from Montana, as there were no trapping records for the state from 1920-1960. In 1950-60, fisher were transplanted from British Columbia to Montana, but population numbers remain low (USFS 1994). Fisher inhabit moist coniferous forests and prefer mature stands with abundant small mammal prey. They generally frequent drainage bottoms, lower slopes, and riparian areas (USFS 1994). Fisher have been documented on both sides of the Continental Divide in the park, including the St. Mary, McDonald, Two Medicine and Many Glacier drainages (GNP files).
- Wolverine (*Gulo gulo*)
The wolverine is a rare resident of coniferous forests and alpine meadows on both sides of the Continental Divide. Breeding has been documented, but population status and trend are unknown. Wolverine were apparently extirpated from Montana by 1920 due to over-harvest, but recovered through dispersal from Canada and Glacier National Park (Newby and Wright 1955). Wolverine appear to require large, isolated tracts of wilderness supporting a diverse prey base. They utilize a range of habitats including alpine areas, mature forest, ecotonal areas, and riparian areas. Wolverines exhibit a distinct seasonal elevational pattern moving to lower elevations during the winter where they search for carrion on ungulate winter ranges. A limiting factor to wolverine distribution may be the availability of suitable denning habitat. Wolverine appear to require remote alpine cirques for denning and are especially sensitive to human disturbance during courtship, denning and rearing of young (Copeland 1996). The park is considered to have very high quality wolverine habitat due to its extensive alpine areas, rugged topography, remoteness, and diverse ungulate populations. Removal of large predators such as wolves and mountain lions from an ecosystem can reduce the amount of carrion available to wolverine. Wolverine have been detected across elevational gradients in most park drainages with sightings concentrated in the Two Medicine, St. Mary, McDonald, and Many Glacier drainages (Yates et al. 1994, Hahr et al. 1999, Hahr et al. 2000).



- Rocky mountain bighorn sheep (*Ovis canadensis*)
Historically common throughout the Rocky Mountains, bighorn sheep experienced population declines beginning in the early 1890s due to disease (transmitted through contact with domestic sheep) and over-harvest. Although current population levels are higher because of reintroductions and hunting regulations, much of historic bighorn sheep range is still unoccupied (Wisdom et al. 2000). While traveling through what is now the east side of Glacier National Park in the late 1880s, naturalist and big game hunter George B. Grinnell concluded that bighorn sheep “are so plenty that they are to be found on every peak.” The park’s bighorn sheep population has been affected by periodic disease and illegal

hunting (GNP files). The park's bighorn sheep population has recently been estimated at a minimum of 445 individuals (Dicus 2001). Assessing historic bighorn sheep population trends in Glacier National Park has proven difficult, due to unreliable population estimates prior to the 1970s (Keating 1985). Data suggest that bighorn sheep no longer utilize some areas in the park where they occurred in the 1930s (Keating 1985).

The park's bighorn sheep mainly range along the crest of the Continental Divide and along the peaks and ridges to the east. The east side of the park provides excellent winter range because the strong winds and sparse vegetation leave the south facing slopes relatively snow-free in winter. Source habitats for bighorn sheep are found mostly in the alpine and subalpine areas where open habitats and high-quality forage exist. Cliffs and steep, rocky terrain are two important habitat features that sheep require for predator avoidance and escape. Post-fire habitats also benefit sheep by increasing visibility and improving forage (Wisdom et al. 2000). Bighorn sheep show seasonal movement patterns between winter, summer, and transitional ranges used for lambing and rutting. If access to these areas is restricted due to habitat fragmentation or direct human disturbance, bighorn sheep may shift their distribution, or experience increased physiological stress (Wisdom et al. 2000). Bighorn sheep are especially sensitive to disturbance during lambing (late April to early June). Knowledge of seasonally important habitats and critical travel routes is passed down from generation to generation. Loss of this knowledge due to local extirpations could preclude the recolonization of suitable habitat for a considerable period of time (Geist 1971). Year-round sheep range occurs in the St. Mary, Two Medicine and Many Glacier drainages (GNP files).

- Townsends' big-eared bat (*Corynorhinus townsendii*)
Townsends' big-eared bats depend on caves and cave-like structures for nursery colonies, day roosts, and hibernacula. This species is a forest generalist within the subalpine, montane woodland, shrubland and riparian community groups (Nagorsen and Brigham 1993). Because of their restrictive habitat requirements, Townsends' big-eared bats have a patchy distribution. Alteration and disturbance of roost structures, exposure to pesticides, changes in insect prey populations, and shooting are the main threats to Townsends' big-eared bat populations in western North America (Wisdom et al. 2000). Although no recent records exist for this species in the park, there are records from adjacent lands in Flathead, Glacier and Lincoln Counties and in British Columbia, Canada. There is also a record of the species collected in 1874 from Waterton Lake. Since the specimen was collected during an international boundary survey, it was quite likely collected in or very near what later became Glacier National Park. Occurrence of this species in the park has not been verified, in part, because extensive bat surveys have never been conducted.
- Silver-haired bat (*Lasionycteris noctivagans*)
Silver-haired bats are known to occur in forested areas and woodlands on both the east and west sides of the Glacier National Park, including the McDonald Valley. This species shows a preference for late-successional stages of subalpine, montane, and riparian woodland community groups (Wisdom et al. 2000). Silver-haired bats use contrasting habitat—forested areas for roosting and open areas for foraging. Large diameter snags and live trees are used for roosting (Christy and West 1993), and shrubs, herbaceous wetlands, and riparian areas are special habitat features necessary for this species. A lack of information has made an assessment of this species' status in northwest Montana and Glacier National Park difficult. Extensive bat surveys have not been conducted in the park and population status and trend are unknown.
- Hoary bat (*Lasiurus cinereus*)
Hoary bats are known to occur rarely in forested areas and woodlands on both the east and west sides of Glacier National Park. This species shows a preference for late-successional stages of

subalpine, montane and riparian woodland community groups. Hoary bats also use younger stands of all montane, and lower montane forest types and aspen and cottonwood-willow for foraging (Wisdom et al. 2000). The hoary bat is an edge-associated species often roosting in deciduous trees or conifers at the edge of clearings (Wisdom et al. 2000). A lack of information has made an assessment of this species' status in northwest Montana difficult. Extensive bat surveys have never been conducted in Glacier National Park and population status and trend is unknown.

- Westslope cutthroat trout (*Oncorhynchus clarki lewisi*)
In 2000, the U.S. Fish and Wildlife Service considered the westslope cutthroat trout for possible listing under the Endangered Species Act, and the decision was made not to list the species. The fish are native to all major drainages within the park, but they are common in the North Fork and Middle Fork of the Flathead River, which remains one of the last strongholds for genetically pure westslope cutthroat in the United States (Marnell 1988). Introductions of non-indigenous sport fish have compromised about 84% of the historical range of the native cutthroat trout in Glacier (Marnell 1988). Despite repeated invasions and introductions of non-native salmonids and the associated genetic contamination of some native populations, many lakes in Glacier still contain secure populations of westslope cutthroat trout (Marnell 1988).

Seventeen lakes in the park contain pure genetic stocks of native westslope cutthroat trout. The remaining fish-bearing lakes contain non-indigenous fish or hybrids that are mostly the introduced Yellowstone cutthroat trout, brook trout, or rainbow trout (*Oncorhynchus mykiss*). Selected spawning streams (along the Middle Fork of the Flathead River and within the park) have been closed to fishing to protect cutthroat spawning areas.

- Shorthead sculpin (*Cottus confusus*)
Shorthead sculpins live in a few streams in the Columbia River drainage. Their habitat ranges from small to large, cold, clear streams to large rivers and deep lakes. Very little is known about the distribution and status of this species in the park.
- Spoonhead sculpin (*Cottus ricei*)
Spoonhead sculpins live in the Hudson Bay Drainage. Their habitat ranges from small, swift streams to large rivers and deep lakes. Very little is known about the distribution and status of this species in the park.
- Trout-perch (*Percopsis omiscomaycus*)
Trout-perch live in the Hudson Bay drainage. Their habitat is typically in lakes, but this species also uses clear to moderately turbid streams, particularly when spawning. Very little is known about the distribution and status of this species in the park.
- Boreal toad (*Bufo boreas*)
Boreal toads are mainly terrestrial and very mobile, and consequently sometimes difficult to detect during field surveys. Adults may also show a seasonal shift to nocturnal behavior or take refuge from hot, dry conditions by burrowing in the ground litter or inside rodent holes. Serious declines of this species throughout portions of its southern range are cause for concern for its status in other regions. Boreal toads were found in most of the major drainages in the park, except portions of the North and Middle Fork, Flathead River drainages. Breeding populations of boreal toads do not often live near predatory fish populations (Marnell 1997). There is a large breeding population of boreal toads in the vicinity of the Two Medicine developed area, and a large migration of young boreal toads was observed in the North Fork in the summer of 2002. Very little is known about the distribution and status of this species in the park.

- **Rocky Mountain capshell (*Acroloxus coloradensis*)**
A relict population of the Rocky Mountain capshell (*Acroloxus coloradensis*), also known as the "Montana capshell" or simply the "capshell," was discovered in a small pond in the Going-to-the-Sun Road area in the mid-1960s. This site is one of only a few in the United States where a viable population has survived. Most other documented capshell populations are in Canada, but they have also been found in several lakes in Colorado. In 1992, it was petitioned for emergency listing as a threatened species in the United States. The U.S. Fish and Wildlife Service rejected the petition. Although *Acroloxus coloradensis* is rare, the Service did not conclude that it is threatened or endangered. Very little is known about the distribution and status of this species in the park.
- **Tailed frog (*Ascaphus truei*)**
The tailed frog is mostly nocturnal and highly aquatic dependent, living in cold turbulent headwaters streams with cobble substrates (Marnell 1997). Populations of this species in Glacier are disjunct. The removal of streamside vegetation and increases in fine sediments can have a negative effect on tailed frog recruitment and survival. Tailed frogs in Glacier can apparently co-exist with fish in streams that have abundant escape cover, a fishery that is mainly lacustrine, and fish that are not predatory (Marnell 1997). Tailed frogs have been observed in very few areas of the park. Most recorded observations are from the McDonald and Two Medicine Valleys and the Middle Fork, Flathead River drainage (U.S. Geological Survey files, Marnell 1997). This species is difficult to detect during surveys due to its nocturnal behavior, and may be more common than current data show. The frog's breeding activity has been documented in the park, but its population trend is currently unknown.
- **Great gray owl (*Strix nebulosa*)**
The great gray owl is a rare resident in mature and old-growth coniferous forest with nearby meadows for foraging and nesting. Great gray owls are a contrast species, requiring the juxtaposition of habitats used for foraging and for nesting/roosting. Snags are a special habitat feature for great gray owls. Great gray owls do not build their own nests but rely instead on large abandoned stick nests and platforms such as the broken tops of large-diameter trees. Great gray owls are widely distributed, although at low population levels, in most forested areas in northwest Montana (Wisdom et al. 2000). The persistence of the great gray owl populations depends on maintaining snag structures, meadow systems, and prey populations (Hayward et al. 1994). Nesting has been documented in the park but status is unknown.
- **Boreal owl (*Aegolius funereus*)**
The boreal owl is a rare resident in mature forests and unmanaged younger forests, especially subalpine and montane forests and riparian woodlands. Snags or large trees with either natural cavities or cavities excavated by other species are used by boreal owls for nesting (Hayward et al. 1994). Forests that include large amounts of decaying woody material near the ground and associated lichens and fungi, support populations of the boreal owl's principal prey, red-backed voles (*Clethrionomys gapperi*). Boreal owls may occur in a patchy geographic pattern making the proximity of neighboring populations crucial to the long-term persistence of the local population (Hayward et al. 1994). Very few areas of the park have been surveyed for owls. Boreal owls were detected in the McDonald, Two Medicine, Cutbank, and North Fork, Flathead River drainages (GNP files). Nesting has been documented but population trend is unknown.
- **Peregrine falcon (*Falco peregrinus*)**
The U.S. Fish and Wildlife Service removed the peregrine falcon from the list of threatened and endangered species in 1999. Although no longer endangered, peregrine falcons, their eggs, parts,

and nests will continue to be protected from unauthorized killing, possession, transportation, and importation by the Migratory Bird Treaty Act (1918). Also, the species will continue to be monitored across the nation for the next 13 years to provide data on at least two generations of peregrines and to ensure that the bird is doing well after being delisted. Peregrine falcons are rare in the park, though sightings are reported nearly every year, occasionally during the nesting season. There have been no recorded peregrine nests in the park. Surveys of potential peregrine falcon nesting habitat began in 1989 and were completed in 1991. Peregrine falcon habitat has been documented in many areas of the park (Yates et al. 1991).

- Northern goshawk (*Accipiter gentilis*)
Northern goshawks are uncommon from spring to fall in forested areas, especially in mature to old-growth coniferous and mixed forests in the park. Adult goshawks generally remain on their territories throughout the year, although they may shift to lower elevations in the fall. Goshawks require large nest trees in dense stands to support their bulky nest structures, and prefer to forage in small openings or dense stands with relatively open understories (Hayward 1983). Goshawks have been observed throughout the park, but only a handful of nests have been documented. Goshawk surveys have been conducted in the St. Mary Valley only. Many sightings have occurred in the McDonald, St. Mary and Many Glacier drainages (GNP files).
- Golden eagle (*Aquila chrysaetos*)
Golden eagles are fairly common in open areas of the park from spring to fall. They nest in cliffs (and possibly trees) throughout the park including the McDonald, North Fork, Middle Fork, St. Mary, Two Medicine, Waterton, and Many Glacier drainages (GNP files). Specific nests have been located and monitored in Glacier National Park, but population status and trend is currently unknown (Yates et al. 1991, Sumner and Schmidt 1998, Sumner and Gilbert 1999). The Many Glacier Valley has a high density of nesting golden eagles.

Productivity for golden eagles in Montana has been low and may be declining (Joslin and Youmans 1999). Golden eagles may be disturbed during the nesting season by human intrusion, resulting in lowered productivity due to disruption of courtship activities, over-exposure of eggs or young birds to weather, and premature fledging of juveniles. Direct mortality of juveniles due to starvation or predation is also possible if adults are displaced from the area and regular nest attendance does not occur (Fyfe and Olendorff 1976).

Golden eagle migration through Glacier National Park has been documented as thousands of eagles travel north to nesting areas in spring and south to wintering areas in autumn (Yates 1994, Yates et al. 2001). The Livingston and Lewis Mountain Ranges, and connecting spur ridges, are used by migrating eagles during these periods and the importance of the travel corridor is still under investigation

Upper McDonald Creek, with about 25 pairs, is considered the most critical harlequin breeding stream in Montana.

- Harlequin duck (*Histrionicus histrionicus*)
Harlequin ducks are fairly common from spring to fall in fast-moving water (streams and rivers) and less frequently on lakes. Productivity is highly variable. Harlequin duck declines have been documented throughout the western populations, including in Montana, where there are approximately 110 pairs (Genter 1993). Upper McDonald Creek, with about 25 pairs, is considered the most critical harlequin breeding stream in Montana (Ashley 1998). Harlequins winter in coastal areas and migrate inland during summer to nest along clean, fast-flowing mountain streams and

rivers where they can breed and nest away from human disturbance (Clarkson 1994). Recreational boating, sport fishing and other human activities have been shown to displace harlequin ducks, especially during nesting and brood rearing periods (Clarkson 1994). A spring boating closure is in effect to protect harlequins from disturbance on several essential harlequin breeding streams in the park. In addition to the McDonald Valley, harlequin pairs and/or broods have also been documented in the Two Medicine, Many Glacier and St. Mary drainages (GNP files). Dr. Grinnell reported seeing a female and brood of six young in the Many Glacier drainage in the early 1900s (Bailey and Bailey 1918), however, no broods have been documented in this drainage since.

- Common loon (*Gavia immer*)
Common loons occur from spring through fall, but rarely during winter, on large and small lakes throughout the park. A high proportion of Montanan's nesting pairs are found in the park, making it especially important to the viability of the state's loon population. The highest productivity occurs among breeding pairs in the North Fork of the Flathead River Valley. Since annual parkwide loon surveys were initiated during the 1980s, breeding has rarely been documented on the east side of the park outside of the Belly River drainage (GNP files). However, common loons have been observed on all the major lakes in the Many Glacier, Two Medicine, and St. Mary drainages. Parkwide productivity appears to have declined since the 1980s (GNP files). Historic information on common loon distribution and productivity is limited.
- Pileated woodpecker (*Dryocopus pileatus*)
The pileated woodpecker is a fairly common resident of late-seral stages of montane, lower montane, and riparian woodland community groups. Pileated woodpeckers depend on large snags for nesting and roosting. Nesting has been documented in the park, but population status and trend are unknown (GNP files).
- Black-backed woodpecker (*Picoides arcticus*)
Black-backed woodpeckers are rare residents of mature to old-growth subalpine, montane, and lower montane forests and riparian woodlands. This species is almost exclusively found in recently burned conifer forests in the park for as long as 10 to 12 years after a fire, with only a few sighting reports from mature forests. The black-backed woodpecker uses beetle-infested forests (Caton 1996). Black-backed woodpeckers excavate cavities for nesting in live trees with heart-rot or recently killed trees (Wisdom et al. 2000). The portion of this species' range, which includes the park, has experienced strong declines in black-backed woodpecker source habitats due to the decline of mature forests and the altered frequency of stand-replacing fires (Wisdom et al. 2000). This species has been documented in the North Fork and McDonald drainages (GNP files). Nesting has been documented, but population trend is unknown.
- Olive-sided flycatcher (*Nattallornis borealis*)
Olive-sided flycatchers breed in forested areas of North America and winter in Central and South America. This species is found in recently burned conifer forest and seems to persist at least 15 years after a fire. It is less dependent on burned forest than the black-backed woodpecker, occurring in mature forest edge habitat throughout the park. They are a contrast species using mature coniferous forests for nesting and forest openings for foraging. They are uncommon from spring to fall in conifer forests, bogs, and recently burned forest. Nesting has been documented but population trend is unknown. Breeding bird survey data for the interior Columbia River Basin indicate populations have declined between 1966 and 1994 (Wisdom et al. 2000). They have been documented in the St. Mary, McDonald, Many Glacier and North Fork drainages (GNP files).

- Northern hawk owl (*Surnia ulula*)
This species is a rare resident and migrant in recently burned forest. Nesting occurs in large-diameter snags and has been documented in the North Fork Valley (Gniadek et al., in prep.), but population trend is unknown (GNP files).
- Ferruginous hawk (*Buteo regalis*)
Ferruginous hawks are rare in grassland habitats from spring to fall, and have been documented in the Many and East Glacier areas. Nesting has not been documented in the park (GNP files).
- Trumpeter swan (*Cygnus buccinator*)
Trumpeter swans are rare on lakes, ponds, rivers and streams during spring and fall migration. Nesting may occur on the east side of the park; in 2002, this species was reported to have successfully raised young on Kootenai Lakes in the Waterton River drainage, near Goat Haunt. This is likely the first documented nesting in the park. Trumpeter swans are known to nest in Waterton Lakes National Park, Canada, and on adjacent ranch lands in Alberta. Trumpeter swans are often observed in spring and fall at the outlet and inlet of Lake McDonald and along Lake Sherburne at Many Glacier (GNP files).
- LeConte's sparrow (*Ammodramus leconteii*)
This bird is rare from spring to fall in wet meadows, primarily in the North Fork; nesting is documented but population trend unknown (GNP files).
- American white pelican (*Pelecanus erythrorhynchos*)
This species is rare during summer adjacent to lower elevation water bodies near the park boundary on both sides of Continental Divide. Most sightings have been on St. Mary Lake, Two Medicine Lake, and Lake Josephine. There is no evidence of breeding in the park (GNP files).
- Black swift (*Cypseloides niger*)
This species is rare in spring and summer; documented in the McDonald, St. Mary, and North Fork drainages with nesting documented in the McDonald Valley (GNP files).
- Black tern (*Chlidonias niger*)
This bird is rare in spring and summer in the North Fork and McDonald Creek drainages and on the eastern boundary of Glacier National Park near the town of Babb, MT (GNP files).
- Forster's tern (*Sterna forsteri*)
This bird is an accidental spring visitor to the park along the east side (GNP files).
- Common tern (*Sterna hirundo*)
This bird is rare in spring and fall along the east side of the park (GNP files).
- Caspian tern (*Sterna caspia*)
This bird is rare in fall along the east side of the park (GNP files).
- Franklin's gull (*Larus pipixcan*)
This bird is uncommon on the east and west sides of the park in spring and summer.
- Black-crowned night heron (*Nycticorax nycticorax*)
This bird is an accidental visitor on the west side of the park.

- Loggerhead shrike (*Lanius ludovicianus*)
This bird is rare in spring, summer and fall east and west of the Continental Divide.
- White-tailed ptarmigan (*Lagopus leucurus*)
This bird is common year-round in alpine areas of the park.
- Brown creeper (*Certhia americana*)
This bird is common year-round in mature forest east and west of the Continental Divide.
- Clark's nutcracker (*Nucifraga columbiana*)
This bird is common year-round east and west of the Continental Divide across elevational gradients. The 50% decline in the whitebark pine population in the park has generated concern over the status of Clark's nutcrackers, a closely associated species.
- Horned grebe (*Podiceps auritus*)
This bird is common in spring and summer on the east and west sides. It is uncommon and rare in fall and winter respectively.
- Barrow's goldeneye (*Bucephala islandica*)
This bird is common in spring, summer and fall on the east and west sides. It is uncommon in winter.
- Hooded merganser (*Lophodytes cucullatus*)
This bird is uncommon in spring, summer and fall on the east and west sides. It is rare in winter.
- Ruffed grouse (*Bonasa umbellus*)
This bird is common year-round throughout the park.
- Long-billed curlew (*Numenius americanus*)
This bird is rare in spring on both sides of the Continental Divide.
- Marbled godwit (*Limosa fedoa*)
This bird is rare in spring on both sides of the Continental Divide.
- Vaux's swift (*Chaetura vauxi*)
This bird is common in spring and summer on both sides of the Continental Divide.
- Calliope hummingbird (*Stellula calliope*)
This bird is common in spring and summer on both sides of the Continental Divide.
- Lewis's woodpecker (*Melanerpes lewis*)
This bird is uncommon in spring and summer on both sides of the Continental Divide.
- Williamson's sapsucker (*Sphyrapicus thyroideus*)
This bird is rare in spring and summer on both sides of the Continental Divide.
- Three-toed woodpecker (*Picoides tridactylus*)
This bird is common year-round throughout the park.

- Willow flycatcher (*Empidonax traillii*)
This bird is uncommon in spring and summer on both sides of the Continental Divide.
- Hammond's flycatcher (*Empidonax hammondi*)
This bird is common in spring and summer on both sides of the Continental Divide.
- Cordilleran flycatcher (*Empidonax difficilis*)
Uncommon in spring and summer on both sides of the Continental Divide.
- Winter wren (*Troglodytes troglodytes*)
This bird is common in spring and summer on the east and west sides. It is uncommon in fall and winter.
- Veery (*Catharus fuscescens*)
This bird is uncommon in spring, summer, and fall on both sides of the Continental Divide.
- Red-eyed vireo (*Vireo olivaceus*)
This bird is uncommon in spring and summer on both sides of the Continental Divide.
- Lazuli bunting (*Passerina amoena*)
This bird is uncommon in spring and summer on both sides of the Continental Divide.
- Brewer's sparrow (*Spizella breweri*)
This bird is uncommon in spring and summer on both sides of the Continental Divide.
- Lark bunting (*Calamospiza melanocorys*)
This bird is an accidental visitor in summer on both sides of the Continental Divide.
- McCown's longspur (*Calcarius mccownii*)
This bird is rare in spring on the east side of the Continental Divide.
- Chestnut-collared longspur (*Calcarius ornatus*)
This bird is rare in spring on both sides of the Continental Divide.

Wildlife Threatened and Endangered Species and Species of Concern by Area

The following section lists wildlife threatened and endangered species and species of concern found in the Going-to-the-Sun Corridor and the developed areas.

The endangered gray wolf and the threatened Canada lynx, grizzly bear, bald eagle, and bull trout are known to occur throughout the Going-to-the-Sun Road corridor.

- **Going-to-the-Sun Road Corridor**
The endangered gray wolf and the threatened Canada lynx, grizzly bear, bald eagle, and bull trout are known to occur throughout the Going-to-the-Sun Road corridor. These 44 wildlife species of concern also use or inhabit the area: the northern bog lemming, swift fox, fisher, wolverine, Rocky Mountain bighorn sheep, silver-haired bat, great gray owl, peregrine falcon, northern goshawk, golden eagle, harlequin duck, common loon, pileated woodpecker, black-backed woodpecker, olive-sided flycatcher, ferruginous

hawk, trumpeter swan, LeConte's sparrow, American white pelican, black swift, loggerhead shrike, white-tailed ptarmigan, brown creeper, Clark's nutcracker, horned grebe, Barrow's goldeneye, hooded merganser, ruffed grouse, long-billed curlew, Vaux's swift, calliope hummingbird, Lewis's woodpecker, three-toed woodpecker, willow flycatcher, Hammond's flycatcher, winter wren, veery, red-eyed vireo, lazuli bunting, Brewer's sparrow, westslope cutthroat trout, shorthead sculpin, tailed frog, boreal toad and Rocky Mountain capshell.

Gray wolf, lynx, grizzly bear, bald eagle and bull trout are known to use areas in the Apgar Village developed area. There are bald eagle forage areas and a documented roost along Lower McDonald Creek near Apgar Village, and a grizzly bear travel corridor crosses McDonald Valley near Apgar and along Lake McDonald.

The Lake McDonald developed area contains known bald eagle roosting and foraging areas, and there is a grizzly bear corridor along the Going-to-the-Sun Road adjacent to the Lake McDonald developed area. Bull trout also live in aquatic areas in the Lake McDonald developed area.

There is no comprehensive information on the exact composition of species of concern found in the Apgar Village, Lake McDonald and Rising Sun developed areas. However, the presence of 41 wildlife species of concern has been documented in the visitor service zone of the Going-to-the-Sun Road corridor. These species include the northern bog lemming, fisher, wolverine, Rocky Mountain bighorn sheep, silver-haired bat, peregrine falcon, northern goshawk, golden eagle, harlequin duck, common loon, pileated woodpecker, trumpeter swan, blackswift, loggerhead shrike, white-tailed ptarmigan, brown creeper, Clark's nutcracker, horned grebe, Barrow's goldeneye, hooded merganser, ruffed grouse, Vaux's swift, calliope hummingbird, Lewis's woodpecker, three-toed woodpecker, willow flycatcher, Hammond's flycatcher, winter wren, veery and lazuli bunting. Bull trout, westslope cutthroat trout, shorthead sculpin, tailed frogs, boreal toads, also live in aquatic areas in the Apgar Village and Lake McDonald developed areas. Columbia spotted frogs, boreal toads and long-toed salamanders occur in the Rising Sun developed area.

- Two Medicine

The threatened Canada lynx, gray wolf and grizzly bear, as well as the endangered bald eagle, are known to live in the Two Medicine area. Thirty-two wildlife species of concern also live in the area, including the fisher, wolverine, Rocky Mountain bighorn sheep, great gray owl, boreal owl, northern goshawk, golden eagle, harlequin duck, common loon, pileated woodpecker, white-tailed ptarmigan, brown creeper, Clark's nutcracker, horned grebe, Barrow's goldeneye, hooded merganser, ruffed grouse, calliope hummingbird, three-toed woodpecker, willow flycatcher, Hammond's flycatcher, winter wren, veery, red-eyed vireo, lazuli bunting, Brewer's sparrow, Columbia spotted frog, tailed frog, boreal toad and westslope cutthroat trout.

Lynx, gray wolf, grizzly bear and bald eagle are known to use areas in or near the Two Medicine developed area, as well as 17 wildlife species of concern. Species of concern include the fisher, wolverine, Rocky Mountain bighorn sheep, northern goshawk, golden eagle, harlequin duck, common loon, pileated woodpecker, brown creeper, Clark's nutcracker, Barrow's goldeneye, ruffed grouse and winter wren. Columbia spotted frogs, tailed frogs and boreal toads also occur in the Two Medicine drainage in areas of the Two Medicine developed area.



USNPS Photo

- **Many Glacier**
The endangered gray wolf and the threatened bald eagle, grizzly bear and Canada lynx are known to live in the Many Glacier area. The federally listed threatened bull trout does not occur in the Many Glacier area; however, this species is found in Swiftcurrent Creek below Lake Sherburne outside the park boundary. There are 28 wildlife species of concern in the Many Glacier area, including the fisher, wolverine, Rocky Mountain bighorn sheep, peregrine falcon, northern goshawk, golden eagle, harlequin duck, pileated woodpecker, olive-sided flycatcher, trumpeter swan, white-tailed ptarmigan, brown creeper, Clark's nutcracker, Barrow's goldeneye, ruffed grouse, calliope hummingbird, three-toed woodpecker, Hammond's flycatcher, winter wren, veery, lazuli bunting, Brewer's sparrow, Columbia spotted frog, boreal toad and long-toed salamander.

Gray wolf, bald eagle, grizzly bear and lynx are all known to use the Many Glacier and Swiftcurrent developed areas. Gray wolf pack activity and lynx have been documented in the Many Glacier Valley and move throughout the developed areas.

Travel corridors for grizzly bears exist near the Many Glacier Hotel and the Swiftcurrent Motor Inn.

There is no comprehensive information on the exact composition of species of concern found in the Many Glacier developed area. However, the visitor service zone provides habitat for fisher, wolverine, Rocky Mountain bighorn sheep, peregrine falcon, northern goshawk, golden eagle, harlequin duck, common loon, trumpeter swan, Barrow's goldeneye, ruffed grouse, Columbia spotted frog, boreal toad and long-toed salamander.

- **Goat Haunt-Belly River**
The endangered gray wolf and the threatened bald eagle, grizzly bear, Canada lynx and bull trout are known to use the Goat Haunt-Belly River area. The St. Mary-Belly River drainage, which includes the area east of the Continental Divide in the Goat Haunt-Belly River area, contains a large amount of lake and stream habitat for bull trout. Thirty-two wildlife species of concern are also known to exist in this area. Species of concern in this area are the fisher, wolverine, Rocky Mountain bighorn sheep, silver-haired bat, great gray owl, boreal owl, peregrine falcon, northern goshawk, golden eagle, harlequin duck, common loon, pileated woodpecker, ferruginous hawk, trumpeter swan, black swift, white-tailed ptarmigan, brown creeper, Clark's nutcracker, horned grebe, Barrow's goldeneye, hooded merganser, ruffed grouse, calliope hummingbird, three-toed woodpecker, willow flycatcher, Hammond's flycatcher and winter wren. Aquatic species of concern found in the Goat Haunt-Belly River area include westslope cutthroat trout, spoonhead sculpin, trout-perch and boreal toad.
The Montana arctic grayling and Yellowstone cutthroat trout, which are also listed by the Montana Natural Heritage Program as "species of special concern," are found in the Goat Haunt-Belly River area, but are not native to Glacier National Park.
- **North Fork**
The threatened bald eagle, bull trout and the endangered Canada lynx, gray wolf and grizzly bear have been documented in the North Fork area. There are five known bald eagle breeding areas in

the North Fork, and two gray wolf packs occupy the area. The North Fork of the Flathead drainage contains a significant amount of lake and stream habitat for bull trout. Forty-four wildlife species of concern are also known to occur in the North Fork area. These species are the northern bog lemming, fisher, wolverine, Rocky Mountain bighorn sheep, great gray owl, boreal owl, northern goshawk, golden eagle, harlequin duck, common loon, pileated woodpecker, black-backed woodpecker, olive-sided flycatcher, northern hawk-owl, trumpeter swan, LeConte's sparrow, black swift, black tern, common tern, loggerhead shrike, white-tailed ptarmigan, brown creeper, Clark's nutcracker, horned grebe, Barrow's goldeneye, hooded merganser, ruffed grouse, long-billed curlew, Vaux's swift, calliope hummingbird, Lewis's woodpecker, three-toed woodpecker, willow flycatcher, Hammond's flycatcher, cordilleran flycatcher, winter wren, veery, red-eyed vireo, lazuli bunting and Brewer's sparrow. The aquatic species of concern in this area are westslope cutthroat trout, shorthead sculpin, tailed frog and boreal toad.

The Yellowstone cutthroat trout, which is also listed by the Montana Natural Heritage Program as a "species of special concern," is found in the North Fork area, but is not native to Glacier National Park.

- Middle Fork

The threatened bald eagle and bull trout, and the endangered Canada lynx, gray wolf and grizzly bear live in the Middle Fork area. The Middle Fork of the Flathead drainage contains a large amount of lake and stream habitat for bull trout. Thirty-three species of concern live in the area, including the fisher, wolverine, Rocky Mountain bighorn sheep, great gray owl, boreal owl, peregrine falcon, northern goshawk, golden eagle, harlequin duck, common loon, pileated woodpecker, black-backed woodpecker, northern hawk-owl, black swift, white-tailed ptarmigan, brown creeper, Clark's nutcracker, Barrow's goldeneye, hooded merganser, ruffed grouse, Vaux's swift, calliope hummingbird, three-toed woodpecker, willow flycatcher, Hammond's flycatcher, winter wren, veery, red-eyed vireo and lazuli bunting. Aquatic species of concern found in the Middle Fork area include westslope cutthroat trout, shorthead sculpin, tailed frog and boreal toad.

The Yellowstone cutthroat trout, which is also listed by the Montana Natural Heritage Program as a "species of special concern," is found in the Middle Fork area but is not native to Glacier National Park.

Federally and State Listed Plant Species

No federally listed threatened or endangered plants have been identified in Glacier National Park at this time. The park may have habitat for the federally threatened water howellia (*Howellia aquatilis*), which is found in northwestern Montana wetlands. Water howellia requires a combination of very particular habitat and weather patterns before it can germinate. Water howellia has not been discovered in park wetlands that have been surveyed. Spalding's catchfly (*Silene spalding*) has recently been listed by the Fish and Wildlife Service as a threatened species. This species occurs in Montana; however, no potential habitat for the species has been identified in Glacier National Park.

The Fish and Wildlife Service lists the slender moonwort (*Botrychium lineare*), a plant species found in Glacier National Park, as a candidate species. The Montana Natural Heritage Program ranks the slender moonwort as a G1/S1 species, meaning that both on a global and state level, the plant is "critically imperiled because of extreme rarity (five or fewer occurrences or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extinction." Slender moonwort grows in open meadows, under trees, roadside ditches, and on limestone cliffs at

higher elevations. It has been found in early successional habitats in the Many Glacier and Chief Mountain Road areas.

The following are plant, moss, and lichen species of concern for Glacier National Park according to species listed as plant “species of special concern” by the Montana Natural Heritage Program. The rank for these species includes the state rank by the Natural Heritage Program, unless the plant is also globally rare, in which case its global rank is also listed.

There are 68 vascular plant species, 35 moss species and two lichen species of concern that are known to occur in Glacier National Park. For many of these species, there is also suitable habitat outside the park.

TABLE 3-3. VASCULAR PLANT SPECIES OF CONCERN

Code Definitions	
GHBR=Goat Haunt-Belly River; GTSR=Going-To-The-Sun Road; MF=Middle Fork; MG=Many Glacier; NF=North Fork; TM=Two Medicine	
G = global status; S = state-wide status; T = rank for subspecific taxon; Q = taxonomic questions involved; H = historically known only from records before 1925; may be rediscovered	
1 = Critically imperiled (<5 occurrences) because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction.	
2 = Has demonstrable factors making it vulnerable to extinction throughout its range (6 to 20 occurrences).	
3 = Either very rare or local throughout its restricted range (21 to 100 occurrences) or vulnerable to extinction because of other factors.	
4 = Apparently secure, though it may be quite rare in parts of its range, especially at the periphery.	
5 = Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery.	
? = Inexact or uncertain. For numeric ranks, denotes inexactness.	

Common Name	Scientific Name	Habitat	Location	Rank
Round-leaved orchis	<i>Amerorchis rotundifolia</i>	along streams and in wet woods, usually with good drainage, often on limestone	GHBR	G5/S2 S3
lyre-leaf rockcress	<i>Arabis lyrata</i> var. <i>kamchatica</i> **	open, rocky slopes in montane and subalpine zones	GTSR	G5T5/ S2
wavy moonwort	<i>Botrychium crenulatum</i>	wet mossy areas, meadows, stream bottoms, around seeps, on edges of marshes, and in wet roadside swales	NF	G3/S2
western moonwort	<i>Botrychium hesperium</i>	grasslands or low vegetation in gravelly soils in the valleys and foothills	MG, MF, NF	G3/S2
mountain moonwort	<i>Botrychium montanum</i>	deep litter of springy, mature forests; also in riparian thickets, mesic meadows, and grassy trail edges where there is little vegetated cover	GTSR	G3/S3
pale moonwort	<i>Botrychium pallidum</i> **	fescue grasslands in the valley zone	NF	G2G3/ S1
peculiar moonwort	<i>Botrychium paradoxum</i>	near lakeshores, open meadows, and in dense stands of tall herbs in foothill and subalpine zones, often on disturbed sites near the Continental Divide	MG, NF	G3/S2

Common Name	Scientific Name	Habitat	Location	Rank
few-seeded bittercress	<i>Cardamine oligosperma</i> var. <i>kamtschatica</i>	moist, sparsely vegetated cliffs at talus slopes above timberline	NF	G5/S1
creeping sedge	<i>Carex chordorhiza</i>	sphagnum bogs at low elevations	NF, GTSR	G5/S2
maritime sedge	<i>Carex incurviformis</i> var. <i>incurviformis</i>	wet rock ledges and small streams above treeline	GTSR	G4G5T4 T5/S1
lens-fruited sedge	<i>Carex lenticularis</i> var. <i>dolia</i> **	wet meadows and boggy ground, along ponds and shallow streams	NF, GTSR	G5T3Q/ S2
pale sedge	<i>Carex livida</i> ***	cold, calcareous, poorly drained lowlands and wet peaty ground at low elevations in foothill and submontane zones, shade intolerant	GTSR	G5/S3
rock sedge	<i>Carex petricosa</i> **	barren, stony, limestone soils	TM	G4/S1
beaked sedge	<i>Carex rostrata</i> **	organic soils of fens and floating peat mats	NF, GTSR	G5/S1
thin-flowered sedge	<i>Carex tenuiflora</i> **	in montane zone around 5,000-ft elevation	NF	G5/S1
bright sedge	<i>Carex tinctoria</i>	meadows, open woods, sloughs, and roadsides	GHBR	G4G5/ SU
pink corydalis	<i>Corydalis sempervirens</i> *	rocky, dry soils of eroding or disturbed slopes, frequently after a burn	MG, GHBR, NF, GTSR	G4G5/ S1
spotted lady-slipper	<i>Cypripedium passerinum</i>	moist to wet forest at low elevations, sand dune complexes, and near streambanks and lakeshores; prefers open habitat to shade	NF, GHBR	G4G5/ S2
mountain bladder fern	<i>Cystopteris montana</i> **	moist areas in the mountains at mid to high elevations	GTSR	G5/SH
Alaskan clubmoss	<i>Diphasiastrum sitchense</i>	meadows and open rocky places at mid to high elevations	GTSR	G5/S3
dense-leaf draba	<i>Draba densifolia</i>	gravelly and stony, open soil of rocky slopes and exposed ridges from the mid-montane to alpine zones	MG, GTSR	G5/S2
Macoun's draba	<i>Draba macounii</i> **	moist to wet areas of cool, slopes, outcrops and streams above treeline	GHBR, GTSR	G3G4/ S1
English sundew	<i>Drosera anglica</i>	with moss in wet, organic soils of fens, swamps and bogs in the montane zone	MF, GTSR	G5/S2
Buckler fern	<i>Dryopteris cristata</i>	moist forest, thickets, marshes, swamps, and sphagnum bogs at low elevations	MF	G5/S2
northern wildrye	<i>Elymus innovatus</i>	sandy meadows, riparian areas, rocky hillsides, and in open lodgepole or spruce forests	GHBR	G5/S1
giant helleborine	<i>Epipactis gigantea</i>	open, wet sites, and in mossy shady areas along rivers, streams, meadows, seeps, and hanging gardens from warm desert shrub to spruce communities	GTSR	G4/S2
Lackschewitz' fleabane	<i>Erigeron lackschewitzii</i>	gravelly, calcareous soil/talus on ridgetops at mid to high elevations	GHBR	G3/S3
slender cottongrass	<i>Eriophorum gracile</i>	in wet, organic soil of fens at mid to high elevations	NF, MF, GTSR	G5/S2

Common Name	Scientific Name	Habitat	Location	Rank
northern eyebright	<i>Euphrasia arctica</i> var. <i>disjuncta</i>	in alpine bogs, moist peaty soil, streambanks, and other wet places	MG, GTSR	G5/S1
viviparous fescue	<i>Festuca vivipara</i> **	moist to wet alpine turf often on slopes between 7,000-8,000 feet	NF, GTSR	G54G5 Q/S2
glaucous gentian	<i>Gentiana glauca</i> **	wet to boggy soils of rock ledges at or above treeline	GTSR	G4G5/ S1
Macoun's gentian	<i>Gentianopsis macounii</i>	boggy soil of wet meadows and fens in the foothill zone	GHBR	G5/S1
northern rattlesnake-plantain	<i>Goodyera repens</i>	shade-loving species found in cool, coniferous forests, usually with a mossy understory	NF	G5/S3
bractless hedge-hyssop	<i>Gratiola ebracteata</i>	drying mud around ponds in the foothills and on the plains	MF, TM	G4/S1
three-flowered rush	<i>Juncus albescens</i>	peatlands and moist, well-developed turf and gravelly soils along streams and seeps in the alpine zone	GTSR, MG	G5/S2
pale laurel	<i>Kalmia polifolia</i>	in peat-lands, including spruce forest and outer lake margins in the montane zone	GTSR, NF	G5/S1
simple kobresia	<i>Kobresia simpliciuscula</i>	moist, organic soils in alpine turf on exposed slopes	GTSR, MG	G5/S2
pinewoods sweetpea	<i>Lathyrus bijugatus</i>	open ponderosa pine and western larch forests at low to mid elevations	NF	G4/S1
ground pine	<i>Lycopodium dendroideum</i>	low elevations in moist, montane forest	GHBR, GTSR	G5/S1
running pine	<i>Lycopodium lagopus</i> **	turf along moist slopes at mid to high elevations	GTSR	G5/S1
short-flowered monkeyflower	<i>Mimulus breviliflorus</i> **	vernally moist soil among rock outcrops in coniferous forests or grasslands at mid elevations	MF	G4/S1
adder's tongue	<i>Ophioglossum pusillum</i>	wet meadows, margins of fens, and gravelly moist soil at low to mid elevations	GTSR	G5/S2
stalked-pod crazyweed	<i>Oxytropis podocarpa</i>	exposed rocky alpine ridges or turfy alpine hillsides, often on limestone substrates	MG	G4/S1
alpine glacier poppy	<i>Papaver pygmaeum</i>	rocky, open slopes at high elevations	GTSR, NF, TM, MG	G3/S3
palmate-leaved coltsfoot	<i>Petasites frigidus</i> var. <i>nivalis</i> **	wet forested areas	GHBR, NF	G5/S1
Banff loose-flowered bluegrass	<i>Poa laxa</i> ssp. <i>banffiana</i> **	mudstone slopes and alpine turf at high elevations	MG	G5?T1/ S1
Austin's knotweed	<i>Polygonum douglasii</i> ssp. <i>austinae</i>	open, graveled, often shale-derived soil of eroding slopes and banks in the montane zone	MF	G5T4/ S2/S3

Common Name	Scientific Name	Habitat	Location	Rank
blunt-leaved pondweed	<i>Potamogeton obtusifolius</i>	shallow waters from low to high elevation	MF	G5/S2
five-leaf cinquefoil	<i>Potentilla quinquefolia</i>	dry, gravelly soil of windswept ridges and slopes in the alpine zone	GTSR, TM	G5T4/S2
one-flowered cinquefoil	<i>Potentilla uniflora</i>	open, gravelly slopes and ridgetops at high elevations	TM, MG	G5/S1
heart-leaved buttercup	<i>Ranunculus cardiophyllus</i>	moist meadows in the foothill zone	GHBR	G4G5/S2
northern buttercup	<i>Ranunculus pedatifidus</i>	moist meadows, grasslands, alpine tundra, or open, rocky soil on windswept ridges; grows best in calcareous regions	GTSR, TM	G5/S1
timberline buttercup	<i>Ranunculus verecundus</i>	meadows, moraines, open slopes and ridges, often in gravelly areas at treeline	GHBR, GTSR, NF, MG	G5/S2
arctic pearlwort	<i>Sagina nivalis</i> ***	moist, open, gravelly soil in the alpine zone	GHBR	G5/S1
Barratt's willow	<i>Salix barrattiana</i>	boggy meadows, moist open hillsides in mountains and along lakeshores and streambanks	GTSR	G5/S1
autumn willow	<i>Salix serissima</i>	cold, often calcareous bogs at low to mid elevations	MG	G4/S2
pod grass	<i>Scheuchzeria palustris</i>	wet, organic soil of fens and bogs at low to mid elevations	GTSR	G5/S2
tufted club-rush	<i>Scirpus cespitosus</i>	wet meadows and bogs at low to high elevations	GTSR, MG	G5/S2
Hudson's Bay bulrush	<i>Scirpus hudsonianus</i> *	wet meadows and springs at low to mid elevations	GTSR, MG	G5/S1
water bulrush	<i>Scirpus subterminalis</i>	submerged in rivers, ponds, lakes, streams, and standing water up to 3 or 4 feet deep at low elevations	GTSR	G4G5/S2
small-flowered groundsel	<i>Senecio pauciflorus</i>	moist meadows and cliffs at mid elevations	NF	G4G5/S1
northern beechfern	<i>Thelypteris phegopteris</i>	boreal, wet temperate, cool mesothermal climates on moist, calcareous cliff crevices or moist banks in rich, damp forest floors	GTSR	G5/S2
little false asphodel	<i>Tofieldia pusilla</i> **	moist, often shallow soils in alpine areas	MG, GTSR	G5/S2
cushion townsendia	<i>Townsendia condensata</i>	open, rocky, soil of exposed slopes and ridgetops at mid to high elevations	MG, TM	G4/S2
Flat-leaved bladderwort	<i>Utricularia intermedia</i>	shallow, standing, or slow-moving water	GTSR	G5/S1
Velvetleaf blueberry	<i>Vaccinium myrtilloides</i>	moist to rather dry forests in the montane zone	GTSR	G5/S1

* only locations in the western US

** only location(s) in Montana

*** only location for the northern Rocky Mountains

TABLE 3-4. MOSS SPECIES OF CONCERN

Scientific Name	Habitat	Location	Rank
<i>Brachythecium turgidum</i>	partially submerged in pond on tundra	GTSR	G4/S1
<i>Bryum lonchocaulon</i>	moist, peaty soils	NF, ,GTSR	G5?/ S1
<i>Bryum pallens</i>	on soil or rocks	MG, GTSR	G4G5/S1
<i>Bryum schleicheri</i>	wet rock surfaces	GTSR	G5?/ S1
<i>Dichodontium olympicum</i>	wet rock surfaces and soil	GTSR	GU/S1
<i>Dicranella grevilleana</i>	moist shaded banks	GTSR	G2G4/S1
<i>Dicranella heteromalla</i>	moist peaty slight slopes	GTSR	G5?/S1
<i>Dicranum fragilifolium</i>	moist shaded banks and slopes and on rotting wood	GTSR	G4G5/S1
<i>Distichium inclinatum</i>	rock surfaces	TM, GTSR	G4G5/S1
<i>Grimmia mollis</i>	rock and occasionally tundra	GTSR	G3G5/ S1
<i>Kiaeria blyttii</i>	rock at mid to high elevations	NF, GTSR	G5/S1
<i>Kiaeria starkei</i>	peaty soils, stream edges, ledges and banks	GTSR	G5/S1
<i>Meesia longiseta</i>	in swamps and sphagnum bogs	GTSR	G4?/S1
<i>Meesia triquetra</i>	moist to wet soils	GTSR	G5/S2
<i>Meesia uliginosa</i>	peaty or calcareous soils, fens, and in wet depressions at high elevations	GTSR	G4/S1
<i>Myurella tenerrima</i>	soil, cliffs, banks and overhangs; fens at mid elevations	GTSR	G3G4/S1
<i>Neckera douglasii</i>	lakeshore	GTSR	G4/S1
<i>Paludella squarrosa</i>	fens, springs, meadows and seeps in tundra at high elevations	GTSR	G3G5/S1
<i>Paraleucobryum enerve</i>	acidic tundra, often in depressions and at the top of rock outcrops at high elevations	GTSR	G5?/S1
<i>Paraleucobryum longifolium</i>	acidic tundra and on rock outcrops at high elevations	GTSR, MF	G5/S1
<i>Plagiobryum demissum</i>	wet rock	GHBR	G3G5/S1
<i>Plagiobryum zierii</i>	wet rock	GTSR, NF	G3G4/S1
<i>Pohlia drummondii</i>	wet to moist soils including clay at mid to high elevations	GTSR	G3G4/S1
<i>Pohlia obtusifolia</i>	cold, wet soil such as the edge of snowfields	GTSR	G2G4/S1
<i>Pseudocalliergon turgescens</i>	wet rock in alpine zone	GTSR	G3G5/S1
<i>Schistostega pennata</i>	moist to wet dark places such as caves and overturned bases of trees	GTSR	G4/S1
<i>Sphagnum centrale</i>	fens and bogs at low to high elevations	GTSR, NF	G5/S1
<i>Sphagnum contortum</i>	fens and bogs at low to high elevations	GTSR	G5/S1
<i>Sphagnum girgensohnii</i>	fens and bogs at low to high elevations	MG, GTSR	G5/S1
<i>Sphagnum magellanicum</i>	fens and bogs at low to high elevations	NF	G5/S1

Scientific Name	Habitat	Location	Rank
<i>Stegonia latifolia</i>	dry soil	GTSR	G3G5/S1
<i>Tayloria lingulata</i>	fens, preferably slightly acidic, at high elevations	GTSR	G3G5/S1
<i>Tayloria serrata</i>	dung, decomposing wood, and soil	GTSR, TM	G4/S1
<i>Thamnobryum neckeroides</i>	rock in the alpine zone	GTSR	G?/SH
<i>Tortula norvegica</i>	wet soils and rocks in the alpine zone	GTSR, MF	G5/S1

TABLE 3-5. LICHEN SPECIES OF CONCERN

Scientific Name	Habitat	Location	Rank
<i>Bryoria subdivergens</i>	alpine sod at high elevations	GTSR	G2/S2
<i>Collema curtisporum</i>	bark of Populus species	GTSR	G3/S2

Plant Species of Special Concern by Area

The following section lists plant species of special concern found in the Going-to-the-Sun Road Corridor and developed areas.

- **Going-to-the-Sun Road Corridor**

There are 52 plant species of concern in the McDonald Valley, including 27 vascular plant species, 24 mosses and one lichen. Plant species include mountain moonwort, western moonwort, wavy moonwort, adder's tongue, slender cottongrass, pod grass, pale laurel, creeping sedge, pale sedge, lens-fruited sedge, tufted club-rush, English sundew, ground pine, Alaskan clubmoss, alpine glacier poppy, velvetleaf blueberry, Hudson's Bay bulrush, flat-leaved bladderwort, lyre-leaf rockcress, pink corydalis, giant helleborine, Macoun's draba, glaucous gentian, water bulrush and northern beechfern. It is possible that beaked sedge may also be located in this valley. Mosses include *Brachythecium turgidum*, *Bryum lonchocaulon*, *Bryum pallens*, *Dichodontium olympicum*, *Dicranella heteromalla*, *Dicranum fragilifolium*, *Distichium inclinatum*, *Kiaeria blyttii*, *Kiaeria starkei*, *Grimmia mollis*, *Meesia triquetra*, *Neckera douglasii*, *Paraleucobryum longifolium*, *Plagiobryum zierii*, *Pohlia drummondii*, *Pohlia obtusifolia*, *Pseudocalliergon turgescens*, *Schistostega pennata*, *Sphagnum centrale*, *Sphagnum contortum*, *Sphagnum girgensohnii*, *Tayloria serrata*, *Tortula norvegica* and *Thamnobryum neckeroides*. The lichen is *Collema curtisporum*.

There are 21 vascular plant species of concern and 12 moss species of concern in the St. Mary Valley. Plants include dense-leaf draba, rock sedge, northern eyebright, little false asphodel, simple kobresia, three-flowered rush, timberline buttercup, five-leaf cinquefoil, northern buttercup, pink corydalis, viviparous fescue, lens-fruited sedge, Barratt's willow, Macoun's draba, mountain bladder fern, northern beachfern, maritime sedge, pale laurel, running pine, alpine glacier poppy and tufted club-rush. Moss species are *Bryum schleicheri*, *Dicranum fragilifolium*, *Dicranella grevilleana*, *Kiaeria starkei*, *Meesia longiseta*, *Meesia uliginosa*, *Myurella tenerrima*, *Paludella squarrosa*, *Paraleucobryum enerve*, *Stegonia latifolia*, *Tayloria lingulata* and *Tortula norvegica*.

One plant species of concern, mountain moonwort, has been observed in the Apgar Village area.

There is a historic record showing a moss species of concern, *Neckera douglasii*, in the Lake McDonald developed area below the lodge. However, there have been no observations of this species since 1901, and a survey in 2001 could not relocate it.

In the Rising Sun developed area, there is a record of a historic siting of pink corydalis. However, no observations of this species have been made since 1928, and a survey in 2001 could not relocate this plant that typically grows in recently burned areas.

- Two Medicine

There are eight plant species of concern in the Two Medicine area: cushion townsendia, bractless hedge hyssop, five-leaf cinquefoil, one-flowered cinquefoil, northern buttercup and mosses *Distichium inclinatum* and *Tayloria serrata*.

There are no plant species of concern in the Two Medicine developed area.

- Many Glacier

There are 18 vascular plants of concern in the Many Glacier area: western moonwort, slender moonwort, peculiar moonwort, pink corydalis, dense-leaf draba, northern eyebright, three-flowered rush, Hudson's Bay bulrush, little false asphodel, cushion townsendia, Banff loose-flowered bluegrass, one-flowered cinquefoil, stalked-pod crazyweed, alpine glacier poppy, autumn willow, tufted club-rush, simple kobresia and timberline buttercup. There are also two moss species of concern in this area: *Bryum pallens* and *Sphagnum girgensohnii*.

There is one historical record of pink corydalis near the Many Glacier Hotel. However, no observations of this species have been made since 1948, and a survey in 2001 could not relocate this plant that typically grows in recently burned areas.

There are no plants of special concern in the Swiftcurrent developed area.

- Goat Haunt-Belly River

Species of concern in the Goat Haunt Valley include bright sedge, ground pine and pink corydalis. There are 12 plant species of concern in the Belly River Valley: palmate-leaved coltsfoot, Macoun's gentian, spotted lady-slipper, round-leaved orchid, northern wildrye, Macoun's draba, Lackschewitz' fleabane, arctic pearlwort, timberline buttercup, heart-leaved buttercup and moss *Plagiobryum demissum*.

- Middle Fork

Ten plant species of concern grow in the Middle Fork Valley, including slender cottongrass, English sundew, buckler fern, bractless hedge-hyssop, western moonwort, short-flowered monkeyflower, blunt-leaved pondweed, Austin's knotweed and mosses *Paraleucobryum longifolium* and *Tortula norvegica*.

NATURAL SOUNDS

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 unspoiled 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 throughout most of the park.

Natural soundscapes are the unimpaired sounds of nature.

Human activities in the park generate artificial noise that varies, depending on time and location. Sources of noise in the park include road traffic, motorboats, scenic air tours, railroad traffic, developed area activity and general maintenance and administrative activities (chainsaws, helicopter flights and emergency vehicle sirens). Elevated noise levels are generally concentrated near campgrounds, lodging, roads and developed areas. Noise from scenic air tours can be heard throughout the park. Future development outside the park, including mineral development, logging and new construction, may also lead to increased noise in the park.

The highest amount of noise is in the developed areas in the park, including the Apgar Village, Lake McDonald, Rising Sun, Two Medicine, Many Glacier and Swiftcurrent developed areas. Traffic, motorboats, people, music and facility management noises prevail in these areas. Road traffic and people generate most of the noise along Going-to-the-Sun Road. Noise in day use zones may include traffic, some motorized boating, horses and people, but natural sound is still prevalent. There is less noise in the rustic zones due to limited traffic, people and horses. The backcountry zones are dominated by natural quiet, except for periodic helicopter flights.

AIR QUALITY

Glacier National Park is classified as a mandatory Class I area under section 162(a) of the Clean Air Act. The act gives the federal land manager and the park manager the responsibility for protecting air quality and related values, including visibility, vegetation, wildlife, soils, water quality, cultural resources, recreational resources and public health, from adverse air pollution impacts. There are no major metropolitan areas within 125 miles of the park, and no regional smog typical of highly populated areas with a high amount of vehicle traffic. The Columbia Falls, Kalispell and Whitefish areas, all just west of Glacier National Park, currently do not attain national air quality standards for fine particulate matter (PM₁₀). The International Air Quality Advisory Board (1998) reported that visibility is being affected by wildfires, prescribed fires and industrial emissions from sources in the northern states and Canadian provinces on the boundary.

Air quality is considered good in Glacier National Park. Airborne particulate matter, including smoke from both natural and manmade fires and dust from unpaved roads, occasionally impairs visibility. Sulfuric compounds, including sulfur dioxide and ammonium sulfate from industrial emissions, can also contribute to local haze. Visibility problems in the park can be more severe when there are inversions. Flathead County, which includes the part of the park west of the Continental Divide, is currently out of compliance with Montana standards for particulate emissions. Montana is required to develop a state implementation plan to attain the standard for particulates.

The annual visibility levels at Glacier National Park are approximately 52 miles, which is lower than typical in the central Rocky Mountains but higher than many eastern sites. Concentrations of fine particles suspended in the ambient air impair visibility. Fine aerosol and coarse aerosol concentrations

averaged $5.5 \mu\text{g}/\text{m}^3$ each. There were no strong seasonal variations except for nitrate, which showed a strong winter peak, and coarse mass, which peaked in the winter. Organics contribute by far the largest amount of fine particle mass (58.4%) followed by sulfate (17.9%), soil (10.4%), light-absorbing carbon (7.7%) and nitrate (5.6%). The organic and soot particles come from vegetative burning and urban sources; sulfates and nitrates come from sources of sulfur dioxide and nitrogen oxides, such as power plants; and coarse mass and soils come from wind blown dust.

Concentrations of sulfate and nitrate ion in precipitation that have been measured in Glacier National Park are comparable on average to other sites in the northwestern United States, but are very low compared to most sites in the eastern United States. In 1997, the park reported a sulfate ion concentration of 0.3 milligrams per liter (mg/L) and a nitrate ion concentration of 0.5 mg/L.

The annual maximum for one-year ozone levels at Glacier National Park is lower than those measured at most of the other monitoring sites on the National Park System. Between 1992 and 1997, the park's annual daily maximum one-hour concentrations were between 58 and 77 ppb. The park's peak ozone levels are comparable to those measured at other National Park System sites in the Pacific Northwest but are much lower than levels measured in National Park System sites in southern California and in the northeast and east-central United States. The park's ozone levels are also well below the U.S. Environmental Protection Agency's eight-hour average ozone standard designed to protect human health.

Winter inversions cause local increases in carbon monoxide at Kalispell, 33 miles southwest of the park's entrance at West Glacier. Most of Flathead County's 70,000 residents live within 15 miles of Kalispell, the largest city in northwestern Montana. Emissions from vehicles, wood-burning stoves and the Columbia Falls Aluminum Company, combined with winter meteorological conditions, cause seasonal increases in carbon monoxide (NPS 1998a).

The main sources of pollutants that surround Glacier National Park west of the Continental Divide are industrialized areas south and west of the park. East of the Continental Divide, pollutants in the air entering the park are often associated with northern air flows from the Canadian Rocky Mountain front. The United States and Canada are considering a variety of air quality tools for managing the issue of air quality across boundaries.

Glacier National Park participates in several air quality monitoring programs. The National Dry Deposition Network measures gaseous pollutants and meteorological information. Ambient ozone, sulfur dioxide, particulate sulfate, particulate nitrate and nitric acid are measured in addition to meteorological data. The Visibility Monitoring and Data Analysis Program/Interagency Monitoring of Protected Visual Environments (IMPROVE) measures visual range, air temperature and relative humidity. Visibility conditions are measured by the IMPROVE sampler, which collects fine particles (PM_{2.5}) of sulfate, nitrate, elemental carbon, soil and PM₁₀ coarse soil. The National Atmospheric Deposition Program/National Trends Network measures acidity, conductivity, precipitation, chemical concentrations, deposition, anions and cations. Fluoride is measured using sodium bicarbonate tube instrumentation and forage and vegetation sampling.

Air quality issues remain the same throughout all of Glacier National Park.

CULTURAL RESOURCES

Recent archaeological evidence suggests that the Clovis people, believed to be the ancestors of American Indians, occupied and used the Glacier National Park area 10,000 to 12,000 years ago (Rockwell 1995). Archaeological and historical evidence of temporary camps and trails shows seasonal use of the area for hunting, fishing, plant gathering and religious practice (Cherry 2001a). Year-round occupation of the area seems to have occurred as early as 5000 B.C. in the Waterton Lakes area. There is evidence of base camps and winter kills in and around Waterton Lakes (Reeves 1970), and of smaller kills and occupation sites in higher meadows, used during the summer and early fall. By the time the first European explorers came, several different tribes inhabited the area. The Blackfeet Indians controlled the wide prairies east of the mountains, and the Salish and Kootenai Indians lived and hunted in the western valleys, and traveled east of the mountains to hunt buffalo.



The fur trade motivated much of the early exploration of the Glacier National Park area by Europeans. Between 1730 and 1850, French, British and American fur traders entered the area to search for beaver pelts. They openly traded with the Indians, introducing the tribes to horses, guns and alcohol. Forts were built, but subsequently, they were mostly abandoned and destroyed. During the period from around 1850 to 1900, settlers and miners came to the area looking for land and minerals, but mining was eventually considered unprofitable. The Great Northern Railway was extended to Kalispell in 1891, and the first permanent residents moved to Lake McDonald in 1892. These residents discovered that they could feed and house wealthy visitors who came to the area, and tourism quickly became a way for settlers to make a living.

In 1897, President Cleveland set aside most of the park's current areas as a "forest reserve," but this status did not preclude mining, hunting, or settling. One of the first park rangers, Frank Liebig, was assigned in 1902. He was in charge of maintaining order and enforcing regulations in the half million acres of forest reserve. Conservationists George Bird Grinnell and Dr. Lyman Sperry promoted turning the land into a national park and helped popularize and romanticize the beauty of the area. The Great Northern Railway, which had tracks that ran just along the south end of the present park, also expressed great interest in the development of a national park, and on May 11, 1910, President Taft signed the bill creating Glacier National Park.

The Great Northern Railway funded most of the construction of the first park structures. A Swiss-style hotel and chalet system was created to attract wealthy tourists to the west. With Glacier Park Hotel (now Glacier Park Lodge), Many Glacier Hotel, the Lewis Glacier Hotel (now Lake McDonald Lodge) and a string of Swiss-style chalets, tourists could ride horseback through several sections of the park. In the early years, only the very wealthy could afford to tour the park, but in the 1920s it became apparent that the park needed to accommodate the increasing number of motorists in America. Going-to-the-Sun Road was dedicated in 1933, allowing motorists to drive through the park. From the 1930s on, when the typical tourists were no longer wealthy rail-riders but traveling motorists, auto camp areas and motels were built at Rising Sun and Swiftcurrent to cater to tourists.

The "Mission 66" program, implemented in 1956 with expected completion by the 50th anniversary of the National Park Service in 1966, was a plan to improve and expand visitor services by increased

staffing, construction of modern buildings, and improvement of roads, campgrounds and other facilities. Mission 66 represents an important era in the history of the National Park Service. There is a growing recognition of the significance of buildings and structures from this period and within a few years, many of them will qualify for listing in the National Register of Historic Places.

HISTORIC RESOURCES

The National Historic Preservation Act of 1966, as amended, mandates that all properties more than 50 years old that may be affected by a federal action be evaluated for eligibility for listing in the National Register of Historic Places. National register listing has been completed for 357 park buildings and structures. Five buildings and one structure have been designated as national historic landmarks.

The following is a description of historic resources that are in the national register.

Going-to-the-Sun Road Corridor

The Going-to-the-Sun Road corridor has one national historic landmark, two historic districts containing 44 contributing buildings and structures, and two sections of historic trails.

The entire length of Going-to-the-Sun Road from the foot of Lake McDonald to Divide Creek is a national historic landmark, a national historic civil engineering landmark, and a national register historic district. Going-to-the-Sun Road and its associated culverts, tunnels and bridges are listed in the national register as the Going-to-the-Sun Road Historic District. The national historic landmark listing of Going-to-the-Sun Road includes the road and 14 associated principal structures, including bridges, tunnels and an underpass. Going-to-the-Sun Road was the first road in the country with historic landmark status. It was nominated, in part, because no other road had its historic associations, artistic and engineering significance, or exceptional state of preservation and integrity. The road was designated a national historic landmark in part for its distinctive “landscape engineering” that blended the practices of civil engineering and landscape architecture. The nomination stated that no other road combined the historic associations, the artistic and engineering significance, and the excellent state of preservation of Going-to-the-Sun Road. The nomination further recognized the road for its exceptional spatial organization, or the composition and sequence of outdoor spaces in the district; circulation, or the means and patterns of movement through the district; topography, or the ways in which the landscape planning considers the site’s topographic features and modifications to them; vegetation, or the consideration of existing vegetation as well as the management of vegetation by pruning, removal and addition of plant material; and structures, including bridges, tunnels, underpasses and trails.

The Sun Camp Fireguard Cabin, adjacent to Going-to-the-Sun Road near Sun Point, is in the national register.

Glacier National Park Headquarters, at the west entrance of the park, is also a historic district. It includes residential buildings, the mess hall, the community building, the carpenter shop, the auto repair shop, the plumbing and electric shop, the sign shop, the entrance station, the trails office and associated outbuildings.

The Fish Creek Bay Boat House on the west side of Lake McDonald and the Upper Lake McDonald Ranger Station Historic District on the northeast tip of Lake McDonald are in the national register as well. The Upper Lake McDonald Ranger Station Historic District includes the ranger station, the boat house, the barn and its associated outbuildings.

The Sperry Chalet Historic District and the Granite Park Chalet Historic District are in the national register, and both chalets are national historic landmarks because of their Swiss chalet style architecture and as remnants of the linked network of hotels and chalets built by the Great Northern Railway. The Sperry Chalet Historic District includes the Sperry Chalet Dormitory, as well as the kitchen/dining room. The Granite Park Chalet Historic District includes the Granite Park Chalet building and Granite Park Dormitory.

The St. Mary Utility Area Historic District is located adjacent to the park boundary near the entrance at St. Mary. The historic district includes one residence, the district office, the dormitory, the electrical shop, the gas and oil building, repair garage/shop, various equipment sheds and outbuildings and the barn, tack room and blacksmith shop.

The 1913 St. Mary Ranger Station, Packers Roost and the Apgar Lookout in the Going-to-the-Sun Road corridor rustic zone, as well as Gunsight Pass Shelter, Logan Creek Patrol Cabin and Mt. Brown, Swiftcurrent and Heaven's Peak Lookouts in the backcountry zone, are in the national register. Part of the Inside Trail from the Cutbank Ranger Station to the former site of St. Mary Chalet; part of the South Circle Trail from the former Sun Point Chalet site to Many Glacier Hotel; and full trail sections from Sun Point to Sperry Chalet and from Sperry Chalet to Lake McDonald Lodge are also in the national register.

The Apgar area is one of the earliest settled areas of Glacier National Park. The first settlers were Milo Apgar, Charlie Howe and Frank Geduhn, who homesteaded on the south shore in what is now Apgar Village. Because the land was not suitable for farming, the early settlers had a difficult time. They relied on hunting and trapping for food until Mrs. Apgar discovered that tourists would pay for home-cooked meals. The early settlers began to provide travelers with meals and guest cabins, and private homes appeared in the area around the foot of Lake McDonald. Apgar developed into a successful village and has served as a major service center ever since. No buildings or structures in the Apgar Village developed area are in the national register; however, the Apgar Village Schoolhouse, now a privately owned gift store, and the National Park Service Permit Office may be eligible for the national register. (See Map 2-3. Apgar Village Existing Features: Cultural, Visitor Use, Buildings.)

The Lake McDonald area is also one of the earliest established areas. George Snyder built the first hotel on the present Lake McDonald Lodge site in 1895. Between 1904 and 1906, Olive and John E. Lewis took ownership of this hotel and began to construct additional guest cabins. Lewis constructed a new hotel, the Lewis Glacier Hotel, on the site between 1913 and 1914. This is the oldest visitor accommodation remaining in the park. The front of the lodge was built to face the lake because it was originally accessible mainly by boat. The Lewis' sold the lodge to a subsidiary (Dakota and Great Northern Townsite Company) of the Great Northern Railway in 1930, which, two years later, sold it to the federal government at one-half of its purchase price. The hotel was renamed Lake McDonald Lodge. A general store was added to the area in 1927, and the coffee shop and a service station were added to the lodge as part of "Mission 66." In 1978, the Lake McDonald Lodge Historic District was listed in the national register.

Lake McDonald Lodge is the centerpiece of the historic district. The Secretary of the Interior designated the lodge as a national historic landmark in 1987 for its architectural significance. The building's design combines elements of the Swiss chalet style while incorporating elements of the rustic style. The historic district also includes the Lake McDonald Lodge cabins and outbuildings; the Garden Court, Cobb House and Snyder Hall Dormitories, and Nietzling Cabin, the General Store, the Recreation Hall and the Boatmen's Residence. The Lower Snyder Creek Bridge, which is close to the



hotel on the old section of Going-to-the-Sun Road, also contributes to the historic district. (See Map 2-6. Lake McDonald Existing Features: Cultural, Visitor Use, Buildings.)

Cabins were built at Rising Sun to accommodate the increase in motoring tourists and the growing need for more affordable visitor lodging. By 1941, the area contained 19 cabins, a general store and a registration building/dormitory located east of Rose Creek and north of St. Mary Lake and Going-to-the-Sun Road. The cabins are located in an irregular pattern along the natural topographical lines of the wooded area. The original design

included two styles of two-unit cabins, one with a full bath and one with a watercloset and sink. This auto camp was the only facility in Glacier National Park that was kept open for tourists during World War II. As part of "Mission 66," a lobby/coffee shop, service station and two medium-priced motels were added. Today, Rising Sun includes 37 motel rooms and 35 cabin units, a restaurant, a camp store, public showers and employee housing.

The Rising Sun Auto Camp Historic District was listed in the national register in 1996 and includes the General Store/Motel, employee dormitories and the original rental cabins. The Rose Creek Campground Camptender's Cabin is also in the national register but is outside of the historic district. (See Map 2-9. Rising Sun Existing Features: Cultural, Visitor Use, Buildings.)

Two Medicine

In the Two Medicine area, there are no historic districts; there are two individually listed buildings, and two sections of historic trail.

On the north side of Cutbank Creek, the Cutbank Ranger Station/Residence, Woodshed and Barn comprise the Cutbank Ranger Station Historic District. Trails from Two Medicine to the former Cutbank Chalets site and from the Cutbank Chalets site to Triple Divide Pass are historic trails in the national register.

The Great Northern Railway built the Two Medicine Chalets in 1914 as part of its string of Swiss chalets. The chalet was located to provide a spectacular view of the surrounding mountains and there was a corral and barn, two boat houses and two piers. Use of the horseback and chalet system declined with the influx of motoring tourists after the opening of Going-to-the-Sun Road in 1933. Lack of public demand for chalet-type accommodations resulted in the burning of the Two Medicine Chalet buildings in 1956. Only the dining hall and a section called Chalet C were left; the dining hall, now the General Store, was designated a national historic landmark in 1987. It was recognized for its Swiss style architecture and association of the Great Northern Railway's chalet system. Swanson Boat House, the General Store and the Two Medicine Campground Camptender's Cabin are listed in the national register. (See Map 2-12. Two Medicine Existing Features: Cultural, Visitor Use, Buildings.)

Many Glacier

In the Many Glacier Area, which includes Swiftcurrent, there are three historic districts containing 64 contributing buildings. The area has one individually listed building and three sections of historic trail.

The Many Glacier entrance station on the north side of Lake Sherburne, as well as the ranger cabin, outbuildings, mess hall and barn are included in the Sherburne Ranger Station Historic District. Portions of the trails from Many Glacier Hotel to the former site of Going-to-the-Sun Chalet, Granite Park Chalet and Cosley Lake are in the national register. Ptarmigan Tunnel is in the national register as well.

The first buildings constructed at Many Glacier were chalets, as part of the Great Northern Railway's Swiss chalet system. Eight chalets were constructed in 1913 on the slope of Mt. Allyn above the future site of the hotel. All but two of the chalets were destroyed by the Heaven's Peak fire in 1936. The two remaining chalets are now the Caretaker's House and the Jammer Dormitory. Soon after the chalets were built, construction of the Many Glacier Hotel began in 1914. A sawmill, built on site east of the hotel, provided the lumber for the hotel's frame, siding and original furniture; and stone for the building's foundation was also quarried on location. The main four-story structure in Swiss Alpine style, as well as the Lower Dormitory, were completed in 1915. In 1917, the Many Glacier Hotel annex was added; and by 1918, additions, including a second annex, pool and support building were completed. The Many Glacier Hotel was the largest hotel in Montana for many years. The sawmill was destroyed in 1925. The Power House was built on the river by 1924, the Boat House was built in 1927, and the Upper Dormitory was built in 1928.

The Many Glacier Hotel District was listed in the national register in 1976; the nomination was amended in 1995, and the Secretary of the Interior designated the hotel a national historic landmark in 1987. It is the largest and most significant structure from the Great Northern Railway period, and is the best example of Swiss Alpine architecture remaining in the park.

The Many Glacier Hotel is the center of the Many Glacier Hotel Historic District, which includes the pedestrian trails and footbridges, Caretaker's House, Lower and Upper Dormitories, Jammer Dormitory, Icehouse, Boat Concessioner Housing (historically the Boat House). The Many Glacier horse concessioner barn and bunkhouse, also in the national register, are located east of the Many Glacier Hotel developed area between Swiftcurrent Lake and Lake Sherburne. (See Map 2-15. Many Glacier Existing Features: Cultural, Visitor Use, Buildings.)

When the Park Service decided to cater to the increasing number of motorists coming to visit Glacier National Park, the Great Northern Railway developed the first cabin camp, known as Swiftcurrent, on a forested site one mile west of Many Glacier Hotel. Twenty-seven cabins were built in 1933, arranged in three circles of nine cabins to imitate rings of Indian tepees. In 1935, a general store was added, and three additional cabins were added the next year. The cabins were moderately priced and became a successful economical alternative to staying in the Many Glacier Hotel. The Heaven's Peak fire of 1936 destroyed all of the original cabins except 12, but the National Park Service replaced most of the cabins and added a coffee shop in 1940. A motor inn was added in 1955. The Swiftcurrent Auto Camp Historic District was listed in the national register in 1996 (Cherry 2001d).

The Swiftcurrent Auto Camp Historic District includes the cabins, laundry and shower building and the Restaurant/Store. The Swiftcurrent Ranger Station Historic District is also located in the Swiftcurrent developed area and includes the ranger station, cabins and outbuildings. The Swiftcurrent Campground Camptender's Cabin is also in the national register. (See Map 2-19. Swiftcurrent Existing Features: Cultural, Visitor Use, Buildings.)

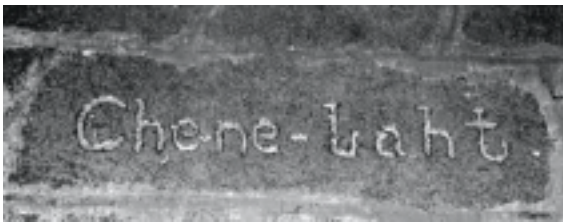
Goat Haunt-Belly River

The Goat Haunt-Belly River area has one historic district containing ten contributing buildings, one individually listed building and two sections of historic trail.

Middle Fork

The Middle Fork area has two historic districts containing six contributing buildings and ten individually listed buildings. The Walton Ranger Station Historic District is in the visitor service zone and includes the ranger station residence and its outbuildings, and eight backcountry cabins.

There are one historic district and several historic patrol cabins and fire lookouts in the Middle Fork backcountry zone.



ARCHAEOLOGICAL AND ETHNOGRAPHIC RESOURCES

Archaeological studies suggest that the ancestors of the Blackfeet, and the Salish and Kootenai people have used and inhabited the area that is now Glacier National Park for over 10,000 years. The Blackfeet, and the Salish and

Kootenai Tribes retain close cultural and spiritual ties to the land within the National Park. By the time the first European explorers came into the area, the tribes now collectively known as the Blackfeet lived in the vast prairies east of the Continental Divide. The Salish and Kootenai Indians lived and hunted in the valleys west of the Continental Divide, traveling east of the mountains to hunt buffalo.

With the westward expansion of the United States, European-Americans began settling the region, and the Blackfeet, and Salish and Kootenai were forced onto reservations. In 1855, the Blackfeet Reservation was created beginning at the Continental Divide and extending east, but in 1895 an agreement with the Blackfeet withdrew the land from their reservation that was later to become the eastern part of Glacier National Park. The Blackfeet Reservation today covers the 1.5-million acres of land bordering the east side of the park. The Flathead Indian Reservation is southwest of the park. (See Map 1-1. Vicinity of Glacier National Park.)

Field studies have located over 400 prehistoric and historic archaeological and ethnographic sites in Glacier National Park (NPS 1999c). The prehistoric sites include camps, sites for fishing and hunting, religious sites and a quarry. There are also historic archaeological sites associated with homesteads and other historic developments, such as roads, trails and chalets.

Many archaeological sites and various natural resource features in and associated with Glacier National Park are also important ethnographic resources. Ethnographic resources are elements of the landscape that are linked by members of a contemporary community to their traditional ways of life. The Park Service more specifically defines ethnographic resources as any “site, structure, object, landscape, or natural resource with traditional cultural meaning and values to associated peoples and other resource users” (NPS Management Policies 2001).

The Glacier National Park region remains an area of profound importance to Native Americans, particularly the Kootenai and Blackfeet, whose traditional associations with these lands extend back well over 1,000 years. Natural features, such as high ridgetops and mountaintops are important vision quest sites; certain plants that grow in the park are used in ceremonies and for healing; and various

animals are believed to possess spiritual powers. Areas in the park that include these resources, and areas where ceremonies were once performed, are sacred to different tribes, including the Blackfeet, and the Salish and Kootenai, and are still used today. While all of the geographic areas in the park have some ethnographic value, there are distinctly important sites in some of the areas.

The archaeological and ethnographic resources of Glacier National Park make up one of the most diverse cultural-historical records of prehistoric resource harvesting, occupancy and vision questing in the Northern Rocky Mountains (Reeves 2000).

Going-to-the-Sun Road Corridor

There are both prehistoric and historic archaeological sites in the Going-to-the-Sun Road corridor. Prehistoric sites in the corridor include evidence of hunting camps, a stone circle, rock cairns, a pictograph site, lithic scatters and a site that demonstrates important cultural and environmental change (Reeves 2000). Historic sites in the area are mostly associated with homesteading and road construction.

Many sites for vision questing have also been identified in the Going-to-the-Sun Road corridor (Reeves 2000).

Two Medicine

Many prehistoric archaeological sites are in the Two Medicine area. Sites include campsites, hunting finds, a rock/cairn alignment related to religion, lithic scatters and isolated finds.

The Two Medicine area contains many ethnographically important areas. In addition to the archaeological evidence listed above, the area is rich in vision quest sites.

Many Glacier

There are several archaeological sites in the Many Glacier Valley. Prehistoric sites include campsites and hunting sites, cairns, isolated finds and lithic scatters (Reeves 2000). Many of the prehistoric archaeological sites in the Many Glacier area, as well as sites identified as vision quest sites, are important ethnographic resources.

Goat Haunt-Belly River

Many archaeological sites connected to prehistoric activities have been found in the Goat Haunt-Belly River area. There is also a prehistoric site that was occupied and used for harvesting resources, and hunting camps, hunting sites, campsites, a pictograph site and lithic scatters (Reeves 2000).

Many vision quest sites have also been identified in the Goat Haunt-Belly River area (Reeves 2000).

Middle Fork

Very few archaeological sites are in the Middle Fork area. Prehistoric lithic scatters and isolated finds have been identified in the Middle Fork Valley.

VISUAL RESOURCES



Glacier National Park is greatly valued for its breathtaking views of sculptured peaks and ridges, deep valleys and sparkling lakes.

GOING-TO-THE-SUN ROAD CORRIDOR

The Going-to-the-Sun Road corridor provides views of a cross-section of the park's environment from the forested lake and streamside areas on each side of the park to the rocky, exposed alpine areas near the Continental Divide.

Dense vegetation in the Apgar Village area limits views but enhances the village/main street scenery. Views to the north down the village main street focus on Lake McDonald as a terminus. The view is partially obstructed by the lakeside Village Inn; however, views from the lakeshore are spectacular. The panoramic view from the lakeshore includes Howe Ridge, Rogers Peak, Stanton Mountain, Mt. Vaught, McPartland Mountain, the Garden Wall, Mt. Cannon, Mt. Brown, Matterhorn, Little Matterhorn, Edwards Mountain, Gunsight Mountain and the Belton Hills.

The Lake McDonald area is densely forested with limited views from in the developed area. From the entrance into the developed area, the view focuses on Lake McDonald Lodge National Historic Landmark. The Lake McDonald lakeside offers unobstructed views of the lake and the surrounding mountains.

The Rising Sun developed area has views of open meadows down-valley to the east and spectacular mountain scenery to the south and west. Views to the south are across St. Mary Lake. The density of vegetation near the cabins filters views in this area and lends to the rustic cabin atmosphere and scenery of Rising Sun.

TWO MEDICINE

The Two Medicine area has an open landscape and views of the abrupt, prominent escarpment of the Rocky Mountain front. The mountains that make up the front are visible from a great distance to the east and define the landscape of the region.

The Two Medicine developed area offers relatively isolated, spectacular mountain scenery. The primary views are across Two Medicine Lake to the mountains, including Rising Wolf Mountain to the northwest. Views from the approach and in the developed area also emphasize the Two Medicine General Store historic landmark against the lake and mountain scenery.

MANY GLACIER

In the Many Glacier area there is a sense of enclosure in the lower valley, and there are views of the mountain peaks from all points in the valley.

The Many Glacier Hotel and developed area were situated to take advantage of the outstanding views. The dominant visual features from the hotel are the views across Swiftcurrent Lake to the mountain peaks. The ridge to the east of the hotel offers 360-degree views up and down the three major valley

systems of the area. Views of the Many Glacier Hotel National Historic Landmark with the backdrop of the lake and mountains are also significant in this area.

The views from the Swiftcurrent developed area are limited due to the density of the surrounding vegetation. Dense vegetation in the area lends to the intentional rustic, cabin-camp scenery of Swiftcurrent. Views open up from the parking lot to the surrounding mountain peaks.

GOAT HAUNT-BELLY RIVER

The Goat Haunt-Belly River area has a sharp interface between the mountains and the prairies to the north and east. It has several lakes that lead the eye to the prominent mountain ranges. A prominent landmark in this area is Chief Mountain, which strides the park boundary and the Blackfoot Indian Reservation and is visible from a great distance on the plains to the east.

MIDDLE FORK

The Middle Fork area is heavily forested with few viewpoints. Views of mountain peaks are most important along the valley floor of the Middle Fork. The Middle Fork of the Flathead Wild and Scenic River can be viewed at points along the west side of this area.

SOCIOECONOMIC ENVIRONMENT

REGIONAL AND LOCAL COMMUNITIES

The affected socioeconomic region is defined as the three-county area of Flathead, Glacier and Lake Counties. (See Map 1-1. Vicinity of Glacier National Park.) This section discusses economic, employment and demographic characteristics for the three-county area.

Economy

The foundation of the regional economy is mainly based on tourism, agriculture and regional trade. Tourism is a large part of the regional economy and has dramatically increased during the last several years as this region has become one of Montana's leading tourist destinations. The trend in tourism has been estimated by reviewing visitation data from Glacier National Park (NPS 1999c), traffic counts on U.S. Highway 2 (WIS 2001), and accommodations tax revenue (Institute for Tourism 1997). All three show steady growth from 1980 to the mid-1990s. About 20% of all non-resident visitor groups in the state travel through the Flathead-Glacier area and about 50% visit the park. These estimates translate to about 750,000 non-resident park visitors, assuming that 7.7 million non-residents visited Montana in 1993-1994 (NPS 1999c).

While diverse recreational opportunities exist in the region, Glacier National Park is the main cornerstone of the regional tourism economy. The park also offers amenities that attract business and industry, as well as individuals who relocate or



retire in the area. The park's seasonal character greatly influences the regional economy. In the last five years, 59% of the average annual park visitors visited in July and August, 29% visited in the shoulder months of June and September and the remaining eight months attracted only 12% of total annual visitors (MK Centennial 2001a). This seasonal fluctuation in visitation influences regional unemployment rates, average personal income and the success of related tourist businesses.

Production of agricultural goods, including hay, wheat, barley and some hardy fruits and livestock, has been a traditional base of the local economy. Federal crop reduction programs and increased development of agricultural land, however, have caused a decrease in agricultural land and employment in the three-county area (MK Centennial 2001a).

Kalispell is approximately 33 miles from the park's entrance at West Glacier. It has become the main trade center for northwest Montana and is important to regional economic activity.

Flathead and Lake Counties have fairly diverse economic structures, while Glacier County has more concentrated economic sectors. In addition to a wide range of recreational opportunities and tourism-related businesses, Flathead County has a variety of manufacturers, a concentration of professional services serving the region, growing numbers of second-home residents and a developing focus on visual and performing arts. Lake County is less dependent on tourism than Flathead and Glacier Counties. The economy of Lake County is concentrated on timber production, electric power generation, medical care and services related to the developing second-home community. Tourism and agriculture are the main drivers of the economy of Glacier County.

Employment

Employment by economic sector for Flathead, Glacier and Lake Counties is shown in Table 3-6. Most jobs related to the tourism and recreation industry are in the retail trade and services sectors of a county's economy. These two sectors account for an average of 52% of the total employment in the three-county area.

Average annual unemployment in the three-county area is 7.6%. This is much higher than the state average of 5.2%, mostly because of the seasonal character of the local economy. Due to the large tourism basis of the local economy, employment varies seasonally in the three-county area. Employment is at its highest in the summer months and at its lowest in the middle of winter (MK Centennial 2001a).

TABLE 3-6. PERCENT TOTAL EMPLOYMENT BY INDUSTRY

Industry	Flathead County	Glacier County	Lake County
Farm	2.2%	8.4%	9.4%
Agriculture¹	1.8%	0.0%	2.0%
Mining	0.4%	2.9%	0.4%
Construction	7.9%	0.0%	6.9%
Manufacturing	11.0%	1.3%	9.6%
Transportation, Communications & Utilities	4.3%	3.8%	2.8%
Wholesale	2.8%	1.8%	1.1%
Retail	21.2%	14.6%	17.8%
Finance, Insurance & Real Estate	7.6%	3.7%	5.1%
Services	31.0%	37.6%	34.1%
Government	9.8%	21.1%	10.8%

¹Includes Agriculture, Forestry and Fishing

Source: Regional Economic Information System, U.S. Bureau of Labor Statistics; U. of Va. Web site

In 2001, the average unemployment rate was 5.9% for Flathead County, 11.1% for Glacier County and 8.6% for Lake County (Montana Department of Labor & Industry). In addition to seasonal jobs that depend on tourism in Glacier County, high unemployment among the Blackfeet Tribe contributes to the increased unemployment rate for this county. The diversification of the economy in Lake County provides year-round employment and more stable levels of employment than in Flathead and Glacier Counties, which are more heavily dependent on tourism (MK Centennial 2001a).

Demographics

Table 3-7 shows selected socioeconomic characteristics for Flathead, Glacier and Lake Counties. American Indians are the leading minority group in the three-county region and therefore are included separately from percent minority population in the table.

There are approximately 114,261 people in the local three-county area, which is approximately 13% of the state's total population (U.S Census 2000). Flathead County is the second largest county in the state and has the fourth largest population. Kalispell, in Flathead County, is the only municipality in the three-county area with more than 10,000 people. In 2000 the population of Kalispell was 14,223. The Blackfeet Indian Reservation covers nearly half of the land in Glacier County and 76% of Glacier County's population is made up of members of the Blackfeet Tribe. The Flathead Indian Reservation, home of the Confederated Salish and Kootenai Tribes, is in Lake County. Over 26% of Lake County's population is American Indian. A higher population of people age 65 and older reflects a trend for Lake County as a popular retirement community.

Over the last several years, there has been sizeable population growth on the west side of the Continental Divide in Flathead and Lake Counties, but growth in Glacier County, on the east side of the mountains, has remained slow. A gradually slower rate of future population growth is expected for the entire three-county area, projected to increase from 114,225 in 2000 to 134,190 in 2010 and 154,260 in 2020 (NPA Data Services Inc.).

**TABLE 3-7. SELECTED SOCIOECONOMIC CHARACTERISTICS FOR
FLATHEAD, GLACIER AND LAKE COUNTIES, MONTANA**

	Flathead County	Glacier County	Lake County	Montana
Population, 2000 Census count¹	74,471	13,247	26,507	902,195
Population percent change, 1990-2000¹	25.8%	9.3%	26.0%	12.9%
Percent population 65 years old and over, 1999 estimate¹	12.8%	9.6%	13.9%	13.3%
Percent American Indian population, 1999 estimate¹	1.8%	60.0%	24.1%	6.5%
Percent all other minority population, 1999 estimate¹	1.9%	0.9%	2.4%	2.8%
Per capita personal income, 2000²	\$23,142	\$15,574	\$17,809	\$22,518
Percent of population below poverty, 1997 model-based estimate¹	14.2%	33.6%	21.4%	15.5%
Percent unemployment, 2001³	5.9%	11.1%	8.6%	4.6%

Sources: ¹U.S. Bureau of the Census, State and County QuickFacts. Data derived from Population Counts 1990 and 2000 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, and 1997 Economic Census.

²Regional Economic Information System, Bureau of Economic Analysis, 2002.

³Montana Department of Labor & Industry.

There are many relatively small identified communities within a short driving distance (approximately 45 miles lineal distance) of Glacier National Park, as shown in the following tables, respectively for the west side and east side of the park.

TABLE 3-8. CITIES, TOWNS AND CENSUS DESIGNATED PLACES (CDPs) WITHIN 45 MILES OF GLACIER NATIONAL PARK (WEST SIDE)

City/Town/CDP	County	2000 Census Population
Big Arm CDP	Lake	131
Bigfork CDP	Flathead	1,421
Columbia Falls city	Flathead	3,645
Dayton CDP	Lake	95
Elmo CDP	Lake	143
Evergreen CDP	Flathead	6,215
Hungry Horse CDP	Flathead	934
Kalispell city	Flathead	14,223
Lakeside CDP	Flathead	1,679
Martin City CDP	Flathead	331
Pablo CDP	Lake	1,814
Polson city	Lake	4,041
Rollins CDP	Lake	183
Somers CDP	Flathead	556
Whitefish city	Flathead	5,032
Woods Bay CDP	Lake	748

Source: U.S. Census Bureau, Released March 21, 2001, compiled by the Montana Department of Commerce

TABLE 3-9. CITIES, TOWNS AND CENSUS DESIGNATED PLACES (CDPs) WITHIN 45 MILES OF GLACIER NATIONAL PARK (EAST SIDE)

City/Town/CDP	County	2000 Census Population
Browning town	Glacier	1,065
Cut Bank city	Glacier	3,105
East Glacier Park Village CDP	Glacier	396
North Browning	Glacier	2,200
South Browning	Glacier	1,677

Source: U.S. Census Bureau, Released March 21, 2001, compiled by the Montana Department of Commerce.

In western Montana, incomes are relatively low. Average per capita income for the three-county region, \$20,841, is 2% below the state average. Regionally, Flathead County has the highest per capita income and Glacier County has the lowest. Flathead County’s per capita income is 10% above the state average. Although Flathead County’s percentage of population in poverty is lower than the state average, Glacier and Lake Counties have percentages of population in poverty well above the state average (MK Centennial 2001a).

THE BLACKFEET AND THE CONFEDERATED SALISH AND KOOTENAI TRIBES

As discussed in the Cultural Resources section, archaeological studies suggest that the ancestors of the Blackfeet, and Salish and Kootenai people have used and inhabited the area that is now Glacier National Park for over 10,000 years. The Blackfeet and the Confederated Salish and Kootenai Tribes retain close cultural and spiritual ties to the land within the park.

When European-Americans began settling the region, the Blackfeet, and Salish and Kootenai were forced onto reservations. Today, the Blackfeet Reservation covers the 1.5-million acres of land

bordering the east side of the park. The Flathead Indian Reservation is southwest of the park. (See Map 1-1. Vicinity of Glacier National Park.)

The natural and cultural resources in Glacier National Park are very important to the Blackfeet, and the Confederated Salish and Kootenai Tribes. The mountain region is considered sacred and is an important place for tribal members to go to for spiritual purposes. Various plants and roots found throughout the park, which have traditional healing and curing abilities, as well as certain animals in the park are also considered sacred. Blackfeet, and Salish and Kootenai tribal members continue to use Glacier National Park for religious and traditional practices. Glacier National Park consults with both tribes to ensure the protection of traditional and spiritual resources.

Both reservations offer tourist attractions for visitors to Glacier National Park. The Blackfeet Reservation hosts the Museum of the Plains Indian, and Blackfeet Historic Sites and Tipi Village Tours. The Flathead Reservation contains the People’s Center cultural center, Flathead Indian Museum, the National Bison Range/Pablo National Wildlife Refuge, and St. Ignatius Mission.

TABLE 3-10. RESIDENT POPULATION OF THE BLACKFEET AND FLATHEAD INDIAN RESERVATIONS

	2000 Census	1990 Census
Blackfeet Reservation	10,100	8,549
Flathead Reservation	26,172 ¹	21,259

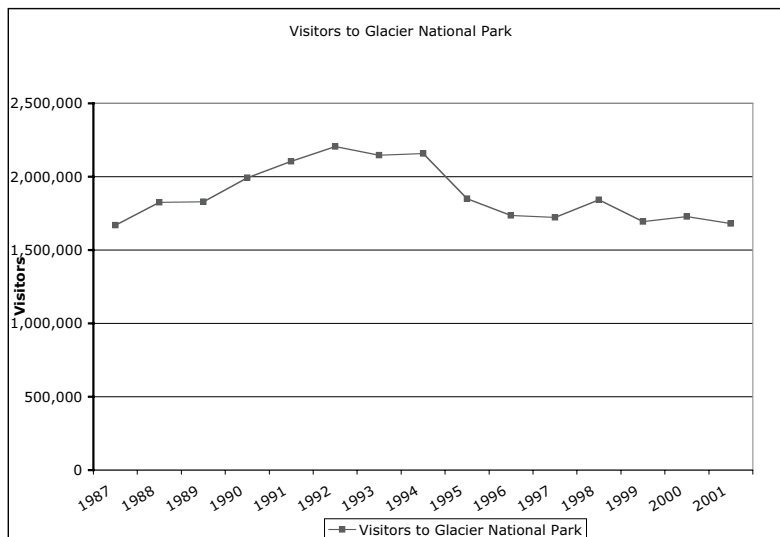
¹ The Census 2000 counted 6,999 residents of the Flathead Reservation identified as American Indians and Alaska Natives alone.

Source: U.S. Census Bureau, Released March 21, 2001, compiled by Montana Department of Commerce.

VISITOR USE AND EXPERIENCE

In recent years, Glacier National Park annual visitation has ranged between 1.7-1.8 million. The highest recorded visitation was 2,204,131, recorded in 1983. Since then, park visitation has exceeded two million only four times. Visitation has fluctuated throughout the years, but the number of visitors has been increasing overall since the Park’s opening in 1911 (NPS 1999c). Figure 3-1 illustrates the annual visitation levels over the past 15 years (NPS, 2002).

FIGURE 3-1. ANNUAL VISITATION LEVELS OVER 15 YEARS



Forecasts of visitor use for Glacier National Park were modeled and calculated in 2000. Table 3-8 illustrates forecasts, the margin of error, and the upper and lower bounds of forecasts for the years 2002 through 2012 (MK Centennial 2000b).

TABLE 3-11. FORECASTED ANNUAL NUMBER OF VISITORS TO GLACIER NATIONAL PARK

Year	Margin of Error	Lower Bound	Forecast	Upper Bound
2002	185,000	1,641,000	1,826,000	2,011,000
2003	198,000	1,647,000	1,845,000	2,042,000
2004	210,000	1,645,000	1,855,000	2,065,000
2005	223,000	1,638,000	1,861,000	2,084,000
2006	236,000	1,629,000	1,864,000	2,100,000
2007	249,000	1,617,000	1,866,000	2,115,000
2008	262,000	1,605,000	1,867,000	2,129,000
2009	275,000	1,593,000	1,868,000	2,142,000
2010	288,000	1,580,000	1,868,000	2,156,000
2011	301,000	1,567,000	1,868,000	2,169,000
2012	314,000	1,554,000	1,868,000	2,182,000

Glacier National Park is among the most prominent tourist destinations in Montana for both non-residents and Montanans. Based on responses to the “Nonresident Summer Travelers to Montana 2001 Survey” (Institute for Tourism and Recreation Research), 32% of all travelers and 43% of vacationers in Montana visited Glacier National Park, second highest to Yellowstone National Park. The Institute for Tourism and Recreation Research defines “Glacier Country” as the area which includes Missoula, and communities in Flathead, Glacier and Lake Counties. This area constitutes the three-county local and regional area that is evaluated. In the Glacier Country, 33% had overnight stays, the highest of any region in Montana (ibid, p. 4). Missoula, located 141 miles from the west entrance of Glacier National Park, hosted 20% of all overnights within the Glacier Country region, followed by East and West Glacier and St. Mary at 17%, Glacier National Park at 15%, Whitefish at 10%, and Kalispell at 8%. As one reason for their trip, 27% of nonresident travelers cited Glacier National Park, second highest of specified sites to Yellowstone National Park (ibid., p. 11).

Montanans comprise 20% of all U.S. visitors to Glacier National Park (NPS 2000d). For Montana visitors, the average number of trips planned to Glacier within the next 3 years was 21, compared to an average of 3 trips for non-residents (MK Centennial, 2001b, p 118). The NPS visitor survey conducted in 2000 also showed that 90% of visitors to Glacier National Park were from the United States and 10% were from a foreign country. Of survey respondents, the average visitor age was 50, while 55% were female and 45% were male. The average travel group size was 2.83 (MK Centennial 2001b).

The survey showed that the average number of days that a group spent in the park was four. The average number of nights spent in the park was also four. The survey asked about visitor travel to different areas of the park and amounts of time spent at each area. The results are shown in Table 3-12.

TABLE 3-12. PERCENTAGE OF VISITORS TO DEVELOPED AREAS AND TIME SPENT AT EACH AREA

Area	Percent of respondents who stopped	Highest % of respondents and length of time stopped
Apgar	48%	28% 15-30 minutes
Lake McDonald	63%	25% 15-30 minutes
Rising Sun	32%	41% < 15 minutes
Two Medicine	18%	36% 1-4 hours
Many Glacier / Swiftcurrent	39%	59% 4 hours - 1 day

The survey found that visitors come to Glacier National Park for a variety of reasons. Sixty-three percent of those contacted said their primary reason for visiting the park on that particular trip was to view the scenery; 16% wanted recreational opportunities such as hiking, biking, boating and camping; 5% wanted to experience a change from their “normal routine;” 4% wanted to enjoy socializing with family and/or friends; 3% came primarily to view wildlife; 2% visited the park primarily to take photographs and 7% visited for other reasons. Eleven percent of visitors camped at night in one of the park’s 13 campgrounds, and more than 29,800 person nights were spent in the backcountry. Six percent participated in guided walks, talks and campfire programs, and 40% visited at park visitor education centers (MK Centennial 2001b).

Visitation and occupancy of concessioner lodging varies greatly by season. Typically, the peak visitation season is July and August. The shoulder seasons are May, June, September and October, and the off-season normally includes the months of November to April. Concessioner lodging has been generally available during the months of May through September. Appendix 7 shows detailed monthly visitation records from 1979 through 2001. Weather and factors of state and national economic and political conditions can affect visitation levels.

Commercial Operations in Glacier National Park

There are currently eight concession contracts, roughly 20 incidental business permits, permits with the United States Forest Service for river rafting services, and rotating call out lists related to emergency road services for the provision of commercial services in Glacier National Park. These include:

TABLE 3-13. Existing Commercial Services in Glacier National Park

Concessioners	Services Provided	Authorization Type
Glacier Park, Inc.	Lodging Food/Beverage/Catered meals Retail/Vending/ATMs Guided Interpretive Vehicle Tours Public Transportation Public Laundry Public Showers	Concession Contract
Glacier Park Boat Co	Boat Tours Small Boat Rentals	Concession Contract
Waterton InterNation Shoreline Cruise Co	Boat Tour – Waterton Lake	Concession Contract
Glacier Wilderness Guides	Guided Day Hiking Guided Backpacking	Concession Contract
Belton Chalet	Sperry Chalet lodging and food service	Concession Contract
Glacier Wilderness Guides	Granite Park Chalet lodging	Concession Contract
Mule Shoe Outfitters	Guided Horseback Riding Horse Packing Services Horse Boarding at Many Glacier Stables	Concession Contract

Concessioners	Services Provided	Authorization Type
Sun Tours	Guided Interpretive Vehicle Tours	Concession Contract
Various Operators	Guided Art Seminars	Incidental Business Permits
Various Operators	Guided Bicycle Tours	Incidental Business Permits
Various Operators	Guided Photography Workshops	Incidental Business Permits
Various Operators	Guided Ski Tours/Snowshoe Tours	Incidental Business Permits
Various Operators	Emergency road services/towing	Rotating call out list
Various Operators	Guided Rafting	USFS Permits

Other commercial services are provided by private landowners in the Apgar area including:

Eddies Grocery and Restaurant
 School House Gifts
 Montana House Gifts
 Apgar Village Lodge
 Cedar Tree Gifts

Some of these services are provided from buildings and facilities within the park and some have their base of operation outside the park boundaries.

ENERGY CONSUMPTION

In April 1999, a memorandum of understanding between the U.S. Department of Energy and the U.S. Department of the Interior was signed to promote the use of energy-efficient and renewable energy technologies and practices in national parks. This initiative will help to fulfill stipulations of both the Energy Policy Act of 1992, which directs the use of energy-efficient building designs and equipment, and Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities. Existing historic lodging facilities and the variety of employee accommodations are in most cases inadequately weatherized causing inefficient heating.

The commercial services plan alternatives could potentially produce minor changes in energy consumption. Electricity is the major energy source used for lodging and visitor service facilities. However, some propane is used at the Many Glacier developed area by the boat and horse concessioners, and diesel is used to power all large commercial boats in the park.

LANDOWNERS IN AND ADJACENT TO PARK BOUNDARIES

As discussed above in the section Regional Location and Setting, Glacier National Park is surrounded mostly by publicly owned and Indian reservation land. Most of the land west and south of the park, west of the Continental Divide, is Flathead National Forestland, and to the south and east of the divide is Lewis and Clark National Forestland (known as the Badger-Two Medicine area). The 1.5 million-acre Blackfeet Indian Reservation is on the park's eastern boundary. Canada's Waterton Lakes National Park, province of Alberta is north and east of the Continental Divide, and the province of British Columbia manages land north and west of the Continental Divide. The Akamina-Kishinena Provincial Park, British Columbia, is at the junction of Montana, Alberta and British Columbia.

There is privately owned land surrounding the park. (See Map 3-2. Adjacent Land Use at Glacier National Park.)

Privately owned land in Glacier National Park boundaries includes land that is undeveloped or used for residential, recreational, or commercial purposes.

Going-to-the-Sun Road Corridor

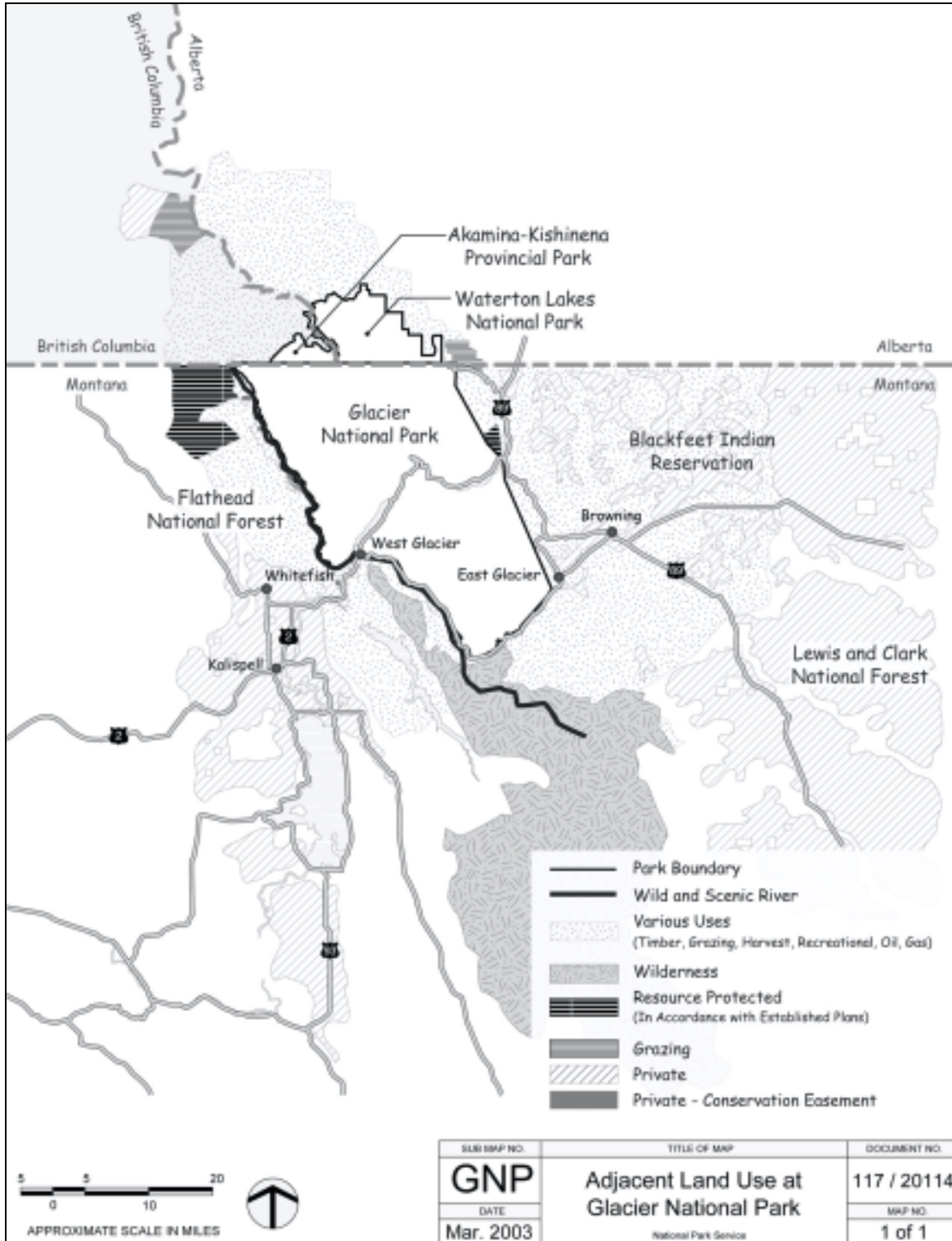
Much of the private land in the park is in the Going-to-the-Sun Road corridor in the Apgar Village area or around Lake McDonald. A large group of private inholdings is located on the south shore of Lake McDonald. The area includes approximately 15 acres, most of which are developed and used as seasonal residences. Five tracts of privately owned land, just over 1 acre in total, are located along the south shore of Lake McDonald between the Apgar Village developed area and the Apgar Campground. All of these tracts are used for residential purposes. There is also a group of privately owned tracts on the north shore of Lake McDonald. The group is composed of over 4 acres total, and contains structures that are used for seasonal residences and utility purposes. Over 16 acres of private land are located at the upper end of Lake McDonald near Upper McDonald Creek. All of this land is used for seasonal residences. A few additional tracts of private land are scattered along the east shore of Lake McDonald between the upper end of the lake and the Lake McDonald developed area. There are also a few small tracts of private land east of the Lake McDonald developed area across Going-to-the-Sun Road.

There are numerous private inholdings in the Apgar Village developed area. (See Map 2-3. Apgar Village Existing Features: Cultural, Visitor Use, Buildings.) The properties are used for a variety of seasonal, commercial and residential uses. A few of the tracts are undeveloped.

Various tracts of private land occur in the Lake McDonald Lodge area. (See Map 2-6. Lake McDonald Existing Features: Cultural, Visitor Use, Buildings.) One of the tracts is used as a private commercial motel during the summer (the Stewart Motel), and the remaining tracts are used as seasonal residences.

Middle Fork

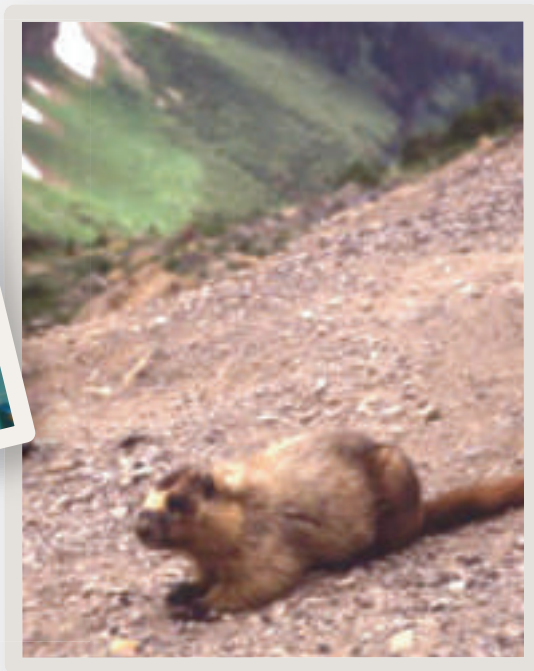
One privately owned tract occurs in the Middle Fork area. A 120-acre privately owned tract is located along the Middle Fork of the Flathead River. The land is currently undeveloped.



MAP 3-2. ADJACENT LAND USE AT GLACIER NATIONAL PARK



Chapter 4 Environmental Consequences





Chapter 4 Environmental Consequences

INTRODUCTION

This chapter describes the potential environmental consequences of the alternatives. The environmental consequences form the scientific and analytical basis for the comparison of the alternatives. To focus the discussion of potential consequences, specific impact topics were selected. The rationale for selecting each topic is discussed in the following section.

The chapter is organized by impact topic. Each topic section includes a discussion of the methodology used to identify and evaluate the impacts, impacts common to all alternatives, impact analysis for each alternative, and assessment of cumulative impacts. The impact analysis also examines the potential impairment to park resources and values.

Impacts are described in terms of context, intensity and duration. The context of impacts are 1) *site-specific* at the location of the action, 2) *localized* on a drainage- or district-wide level, 3) *widespread* throughout the park, or 4) *regional* outside of the park. The intensity and duration of impacts varies for each impact topic. Thresholds of impact for each topic are defined in Table 4-1.

Existing conditions are described for the *status quo/no action* alternatives. These alternatives provide the baseline conditions for evaluating changes and related environmental impacts for the remaining action alternatives. Impacts are often similar for all alternatives, but differences in impacts are identified and compared as appropriate. All impacts have been assessed assuming that mitigation measures would be implemented (see “Mitigation” in Chapter 2).

Table 4-1, Impact Threshold Definitions on the following pages defines the intensity levels (negligible, minor, moderate, major) and duration for all of the impact topics considered in this discussion. Descriptions of the impacts follow Table 4-1.

TABLE 4-1 IMPACT THRESHOLD DEFINITIONS

Impact Topic	Negligible	Minor	Moderate	Major	Duration
Water Quality	Water quality would not be affected, or changes would be either non-detectable or if detected, would have effects that would be considered slight.	Changes in water quality would be measurable, although the changes would be small and the effects would be localized.	Changes in water quality would be measurable and would be noticeable on a widespread scale.	Changes in water quality would be readily measurable, would have substantial consequences, and would be noticed on a regional scale.	Short-term – After implementation, recovery would take less than one year. Long-term – After implementation, recovery would take longer than one year or effects would be permanent.
Floodplains	Floodplains would not be affected, or changes would be either non-detectable or if detected, would have effects that would be considered slight, site-specific.	Changes in floodplains would be measurable, although the changes would be small and the effects would be localized.	Changes in floodplains would be measurable but site-specific.	Changes in floodplains would be readily measurable, would have substantial consequences, and would be noticed on a localized scale.	Short-term – After implementation recovery would take less than one year. Long-term – After implementation recovery would take longer than one year or effects would be permanent.
Soils	Effects on soils would be below or at the lower levels of detection. Any effects on soil productivity or fertility would be slight.	Effects on soils would be detectable. Effects on soil productivity or fertility would be small, as would the area affected.	Effects on soil productivity or fertility would be readily apparent, and effects would result in a change to soil character over a relatively wide area or at multiple locations.	Effects on soil productivity or fertility would be readily apparent and would substantially change the character of soil resources over a very large area.	Short-term – After implementation, would recover in less than 3 years. Long-term – After implementation, would take more than 3 years to recover or effects would be permanent.
Vegetation	No native vegetation would be affected or some individual native plants could be affected, but there would be no effect on native species populations. The effects would be on a small scale, and no species of concern would be affected.	Native plants would be affected over a relatively small area and a minor portion of a species' population.	Native plants would be affected over a relatively wide area (greater than 5 acres) or at multiple locations, and would be readily noticeable.	There would be a widespread effect on native species' populations or a considerable effect on native plant populations, including species of concern, over a very large area (greater than 10 acres).	Short-term – After implementation, would recover in less than 3 years. Long-term – After implementation, would take more than 3 years to recover or effects would be permanent.

Impact Topic	Negligible	Minor	Moderate	Major	Duration
Wildlife, including Aquatic Species	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 on wildlife would be detectable, although the effects would be localized, and would be small and of little consequence to the species' population.	Effects on wildlife would be readily detectable and widespread, with consequences at the population level.	Effects on wildlife would be obvious and would have substantial consequences to wildlife populations in the region.	Short-term – After implementation, would recover in less than 1 year. Long-term – After implementation, would take more than 1 year to recover or effects would be permanent.
Threatened and Endangered Species	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 affect" determination in U.S. Fish and Wildlife Service terms and 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 long-term consequence to individuals, population, or habitat. Moderate effect would equate with a "may affect" 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 affect" 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 – After implementation, would recover in less than 1 year. Long-term – After implementation, would take more than 1 year to recover or effects would be permanent.
Natural Sound	Effects would not be perceptible.	Effects would result in an increase in noise levels in localized areas.	Effects would result in a readily detectable, widespread introduction of noise.	Effects would result in an introduction of noise.	Short-term – Would occur during implementation. Long-term – Would be permanent

Impact Topic	Negligible	Minor	Moderate	Major	Duration
Air Quality	Changes in air quality would not be measurable.	Effects would result in a measurable change in air quality, although the changes would be small and the impacts would be localized.	Effects on air quality would be readily measurable and widespread.	Effects would be readily measurable on a regional scale, and air quality standards could be exceeded.	Short-term – Would occur during implementation. Long-term – Would be continual or permanent.
Archaeological and Ethnographic Resources	Impacts would be at the lowest level of detection — barely measurable with no perceptible consequences. For purposes of Section 106, the determination of effect would be no adverse effect.	Disturbance of a site(s) would be confined to a small area with little, if any, loss of important information potential. For purposes of Section 106, the determination of effect would be no adverse effect.	Disturbance of the site(s) would not result in a substantial loss of important information potential. For purposes of Section 106, the determination of effect would be no adverse or adverse effect.	Disturbance of the site(s) would be substantial and would result in the loss of most or all of the site and its potential to yield important information. For purposes of Section 106, the determination of effect would be adverse effect.	Short-term – Would occur only during implementation. Long-term – Would be continual or permanent.
Historic Resources	Impact(s) would be at the lowest level of detection — barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be no adverse effect.	Impact would alter a character defining feature(s) of a historic resource, but the work would be in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. For purposes of Section 106, the determination of effect would be no adverse effect.	Impact would alter a character defining feature(s) of the historic resource, diminishing the integrity of the resource, but still maintaining its eligibility for the national register. For purposes of Section 106, the determination of effect would be adverse effect.	Impact would alter a character defining feature(s) of a national historic landmark, diminishing the integrity of the resource to the extent that its designation is threatened. For purposes of Section 106, the determination of effect would be adverse effect.	Short-term – Would occur only during implementation. Long-term – Would be permanent.
Visual Resources	Effects would not result in any perceptible changes to existing viewsheds.	Effects would result in slightly detectable changes to a viewshed in a small area or would introduce a compatible human-made feature to an existing developed area.	Effects would be readily apparent and would change the character of visual resources in an area.	Effects would be highly noticeable or would change the character of visual resources by adding human-made features into a mostly undeveloped area or by removing most human-	Short-term – Would be temporary during implementation. Long-term – Would be permanent or continual.

Impact Topic	Negligible	Minor	Moderate	Major	Duration
Regional and Local Communities	Effects would be below or at the level of detection. The effect would be slight.	Effects would be detectable but would be slight.	Effects would be readily apparent.	Effects would be readily apparent and would cause substantial changes to socioeconomic conditions in the region.	Short-term – Would occur only during implementation (varies by site to a maximum of 10 years). Long-term – Would be continual or permanent.
Blackfeet and Salish-Kootenai Tribes	Effects would be below or at the level of detection.	Effects would be detectable but changes in employment rates or cultural impacts would be slight.	Effects would cause an apparent change in employment rates or would have apparent cultural impacts.	Effects would have an important impact on employment rates or park resources that have religious or cultural significance to the Blackfeet or Confederated Salish and Kootenai Tribes.	Short-term – Would occur during implementation. Long-term – Would be continual or permanent.
Visitor Use and Experience	Changes in visitor use and/or experience would be below or at the level of detection.	Changes in visitor use and/or experience would be detectable, although the changes would be slight.	Changes in visitor use and/or experience would be apparent.	Changes in visitor use and/or experience would be readily apparent and would have important consequences.	Short-term – Would occur during implementation. Long-term – Would be continual or permanent.
Energy Consumption	Effects would be below or at the level of detection. The effect would be slight.	The effects would be detectable, but impacts would not have an appreciable effect on parkwide energy consumption.	The effects would result in readily apparent widespread changes in energy consumption.	The effects would be readily apparent and would cause substantial changes to energy requirements on a regional scale.	Short-term – Would occur during implementation. Long-term – Would be continual or permanent.
Landowners In and Adjacent to Park Boundaries	Changes would be below or at the level of detection.	Changes would be detectable, although the changes would be slight.	Changes would be apparent.	Changes would be readily apparent and would have important consequences.	Short-term – Would occur during implementation. Long-term – Would be permanent.

IMPACT TOPICS CONSIDERED

The criteria for selecting impact topics was based on federal laws, regulations and executive orders, National Park Service management policies, knowledge of resources, and concerns expressed by the public.

Natural Resources

- **Water Quality**
Water quality in Glacier National Park is very high, and some of the commercial services take place on or near bodies of water in the park. Actions in the park that affect water quality could have downstream effects as well.
- **Floodplains**
Floodplains in proximity of Many Glacier, Swiftcurrent, Apgar Village, Lake McDonald, Rising Sun and Two Medicine developed areas are assessed to determine 1) effects of the alternatives on floodplains, or 2) risks posed by floodplains on human safety and park developments in accordance with Executive Order 11988 and National Park Service guidelines for implementing the executive order.
- **Soils**
Many of the soil types in Glacier National Park limit construction or development. Soils are also a valued natural resource that supports valued vegetation and wildlife habitat in the park. Soils are assessed to determine how they would be affected by the alternatives.
- **Vegetation**
Wide variations in elevation, climate and soil promote vegetation diversity in Glacier National Park. The park supports over 1,100 species of vascular plants and at least 870 non-vascular plants, including many rare and sensitive species. The park's plant communities and broad ecological communities are important park resources that could be affected by actions that would change human use and development patterns in the park.
- **Wildlife, Including Aquatic Species**
Glacier National Park is noted for its abundant wildlife and as a refuge for sensitive and rare species. Habitat for over 300 terrestrial wildlife species is found within the park, which is also a corridor for wildlife interaction and migration. Alternatives are evaluated to determine impacts on wildlife and how actions may change human use and development patterns in the park.

As aquatic habitats outside the park become more degraded, the importance of protecting waters inside the boundaries of the park becomes increasingly significant for aquatic species. Actions proposed by the alternatives are evaluated to determine impacts on aquatic resources in Glacier National Park.

- **Threatened and Endangered Species**
The Federal Endangered Species Act requires an examination of impacts on all federally listed threatened or endangered species. Glacier National Park supports populations of these species that are federally listed as threatened: the bald eagle, grizzly bear, Canada lynx, bull trout, and the endangered gray wolf.

- **Natural sound**
Natural sound and the opportunity to experience solitude are valued resources in Glacier National Park. The public has expressed concern that commercial services would affect noise levels in the park, and the actions of the proposed alternatives are evaluated to determine impacts on the noise level in the park.
- **Air Quality**
Glacier National Park is a Class I air quality area under the Clean Air Act, which requires federal land managers to protect park air quality and air quality-related values. Impacts on air quality due to increased visitation, recreational use and regional effects on the park are of concern. Changes in visitor use patterns could also affect the park's air quality. Actions of the alternatives are therefore assessed to determine impacts on air quality in the park.

Cultural Resources

- **Historic, Archaeological and Ethnographic Resources**
Many structures and buildings in Glacier National Park are listed in the National Register of Historic Places and there are six national historic landmarks in the park. Past and ongoing studies have found Glacier National Park to be rich in archaeological resources, and many ethnographic resources exist in the park that are associated with cultural and religious practices and that are still used by American Indian tribes today.
- **Visual Resources**
The establishment of Glacier National Park was rooted in the preservation and appreciation of the scenic resources of the area. Because the park is highly valued for its breathtaking views, the alternatives are analyzed for their effects on scenic and visual resources.

Socioeconomic Resources

- **Regional and Local Communities**
Glacier National Park contributes to the local and state economies in various ways, including tourism, employee and operational expenditures. The alternatives are analyzed for their effects on regional and local communities.
- **The Blackfeet and the Confederated Salish and Kootenai Tribes**
The park has sacred and cultural significance for the Blackfeet and Salish-Kootenai Tribes. The effects of the alternatives on these resources are analyzed.
- **Visitor Use and Experience**
Providing opportunities to experience, understand, appreciate and enjoy natural and cultural resources is one of the fundamental purposes of Glacier National Park. Many actions considered in this *Draft Commercial Services Plan and Draft Environmental Impact Statement* could affect patterns of visitor use and the type and quality of the visitor experience. The alternatives are therefore assessed to determine their impact on them.
- **Energy Consumption**
Energy requirements of the alternatives are assessed in accordance with the National Energy Policy Act.

- **Landowners In and Adjacent to Park Boundaries**
There is private land inside and adjacent to Glacier National Park's boundary and developed areas. Effects on private land are analyzed for each of the alternatives.

IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS

- **Wetlands**
Executive Order 11990, Protection of Wetlands, requires federal agencies to avoid, where possible, impacts on wetlands. A contractor conducted site surveys during the summer of 2001 (DeArment 2001) to determine whether there are wetlands within the Apgar Village, Lake McDonald, Rising Sun, Two Medicine, Many Glacier, or Swiftcurrent developed areas that would be affected by the alternatives. All proposed actions in the developed areas and all necessary and appropriate services would avoid wetland areas, and wetlands would not be affected.
- **Wild and Scenic Rivers**
The North Fork and Middle Fork of the Flathead River, which border the west and south side of Glacier National Park, are designated as part of the Flathead Wild and Scenic River under the Wild and Scenic Rivers Act. The act requires the preservation of the free-flowing condition and water quality of wild and scenic rivers. Commercially guided rafting would continue to be provided on the Middle Fork and North Fork of the Flathead River under the conditions of a permit issued by the U.S. Forest Service under the authority of the Wild and Scenic River Act and would have no new impact on the Flathead Wild and Scenic River corridor. The commercial services plan would have no additional impact on wild and scenic rivers; therefore, this topic was dismissed from further analysis in this document.
- **Prime and Unique Farmlands**
In 1980, the Council on Environmental Quality 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 as prime or unique. There are no "prime or unique farmlands" in Glacier National Park.
- **Environmental Justice**
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires federal agencies to analyze the impacts of park actions on minority populations. The project would not have health or environmental effects on minorities or low-income populations or communities. Decisions regarding who receives these concession contracts would be made during the contract award process. Therefore, environmental justice was dismissed as an impact topic in this document.

CUMULATIVE IMPACTS

The Council on Environmental Quality regulations, which implement the National Environmental Policy Act, require the 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 reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.

Because the impacts between individual alternatives under the commercial services plan would not be substantially different, cumulative impacts for all alternatives were analyzed for each impact topic under one heading. Cumulative impacts were determined by combining the impacts of the commercial services plan with other past, present and reasonably foreseeable future actions.

Over the past fifteen years, concessioners and the National Park Service have undertaken a variety of rehabilitation projects on the concessioner facilities in Glacier National Park. For example, at Lake McDonald Lodge, projects include the rehabilitation of the lodge building and improvements to the access drive, rehabilitation work on the lodge dormitories, cabins, auditorium and employee recreational facility, and upgrades to lodge electrical panels, fire and alarm systems, and sewage lines. At Swiftcurrent Motor Inn, improvements include upgrades of the sewer lines, shower facilities, handicapped accessibility in the motels and lobby, remodeling of the campstore and upgrades to electrical wiring and lighting throughout the complex. At Many Glacier, actions include upgrades to the electrical service, stabilization of one wing of the hotel, improvements to the alarm and sprinkler system and replacement of a bunkhouse for the horse concession. At Two Medicine, a ticket booth was added for the boat concession and repairs made to the roof and skylight at the campstore. At Apgar, parking was added, the Village Inn office expanded to enlarge a manager's quarters and a horse concession ticket office was added. While this is not an exhaustive list, it provides examples of the types of actions that have been taken on facilities in the recent past.

Other actions by the National Park Service include instituting vehicle size restrictions on the Going-to-the-Sun Road in 1992, rehabilitation to utility systems around the park, and continuing road rehabilitation on the Camas, Many Glacier and Going-to-the-Sun Roads.

To assess cumulative impacts, other past, ongoing or reasonably foreseeable future actions within or near the park were identified. Ongoing and reasonably foreseeable future actions are described in the following table, and an analysis of cumulative impacts is discussed in subsequent sections for each impact topic.

**TABLE 4-2 PAST, ONGOING AND REASONABLY FORESEEABLE FUTURE ACTIONS
ASSESSED FOR CUMULATIVE IMPACTS**

Action	Geographic Location	Activity	Schedule
Glacier National Park			
Repairs to critical sections of the Going-to-the-Sun Road	Glacier National Park	Various repairs to the Going-to-the-Sun Road as needed and as funding becomes available.	Ongoing
Stabilization and rehabilitation of the Belton Bridge	Glacier National Park	Replace abutments and wingwalls, rehabilitate concrete arch, and install a new timber structure and decking.	2001–2003
Water system rehabilitation for Apgar and Park Headquarters	Glacier National Park	Convert to a fully pressurized system, implement water conservation measures, install new distribution pipelines and additional water storage tank for fire.	2003
Construction of West Side Discovery Center	Glacier National Park	Design and construct West Side Discovery Center for visitor information and orientation north of the T intersection.	Not funded. Date to be determined.
West Glacier entrance station improvements	Glacier National Park	Construct new kiosks, improve access lanes and parking, and provide visitor orientation pull-off.	Not funded

Action	Geographic Location	Activity	Schedule
Installation of a micro-hydro electric power generator at the Goat Haunt Ranger Station complex	Glacier National Park	Installed a micro-hydro electric power generator.	2002
Construction of a fire cache and housing in Two Medicine	Glacier National Park	Construct a wildland fire cache and a duplex employee housing unit.	2003
Construction of a fire cache in the St. Mary administrative area	Glacier National Park	Construct a wildland fire cache.	2003
Going-to-the-Sun Road rehabilitation	Glacier National Park	Rehabilitate the Going-to-the-Sun Road between West Glacier and St. Mary to address drainage deficiencies, slope stability, retaining walls, arches, guardwalls and tunnels, and deteriorating roadway pavement.	2004
Many Glacier Hotel stabilization: Phases I-VII	Glacier National Park	Emergency stabilization and code upgrades to address deteriorated condition of the hotel.	Ongoing
Historic rehabilitation of Sperry and Granite Park Chalets	Glacier National Park	Sperry: restored to full service and new toilet facilities installed. Granite Park is unfunded.	1997-2001 Unfunded.
West Glacier wastewater rehabilitation	Glacier National Park	Rehabilitate wastewater system to improve treatment.	2003
Dock rehabilitation	Glacier National Park	Rehabilitate selected boat docks for the physically challenged.	2003
Many Glacier sewage rehabilitation	Glacier National Park	Exact solution to be determined.	Not funded Some work completed.
Montana Department of Transportation			
US 2 reconstruction	Columbia Falls to Badrock Canyon and Badrock Canyon to Hungry Horse	Reconstruct highway; 2-lane, 2-way traffic maintained.	2003; 2005–2006
US 2 reconstruction	Badrock Canyon	Reconstruct highway; blasting delays possible.	Within the next 10 years.
US 2 reconstruction	Blackfeet Reservation	Reconstruct highway; 2-lane, 2-way traffic maintained.	2002–2009
US 89 reconstruction	Blackfeet Reservation	Reconstruct highway; 2-lane, 2-way traffic maintained.	2002–2012
US 93 reconstruction	Kalispell, Whitefish	Reconstruct highway; 2-lane, 2-way traffic maintained.	2003–2006
Two Medicine Bridge replacement	US 2 crossing of Two Medicine River	Replace bridge and improve approach.	2003
U.S. Forest Service			
Timber salvage and resource rehabilitation	Flathead National Forest	Timber salvage, logging, forest rehabilitation associated with forest fire	2002–2005
Canyon Creek Bridge replacement	Flathead National Forest, east side of Hungry Horse Reservoir	Bridge replacement	2004
Trail construction and reconstruction	Lewis & Clark National Forest, near southeastern border of Glacier National Park	Trail reconstruction, trail establishment and switchback construction	2002–2003
Montana State Forest			
Timber salvage and resource rehabilitation	Coal Creek State Forest	Timber salvage, logging, forest rehabilitation associated with forest fire	Ongoing

IMPAIRMENT OF PARK RESOURCES AND VALUES

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 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 on 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 would be more likely to constitute an impairment to the extent that 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 or other relevant National Park Service planning document.

Impairment may result from National Park Service activities in managing the park, visitor activities or activities undertaken by concessioners, contractors and others operating in the park. Determinations on impairment are made in subsequent sections for each impact topic.

ANALYSIS OF IMPACTS

In the analysis that follows, when a necessary and appropriate service and/or an alternative A is not affected by an impact topic, it is omitted from the discussion.

WATER QUALITY

Methodology

Current water quality conditions were assessed through consultation with Glacier National Park staff. Alternatives were evaluated on the basis of data and other information gathered from annual monitoring reports and current literature reviews. Data from field visits was used along with information from other environmental assessments and environmental impact statements.

Thresholds of impact are defined in Table 4.1.

- *Negligible:* Water quality would not be affected, or changes would be either non-detectable or if detected, would have effects that would be considered slight.



- *Minor:* Changes in water quality would be measurable, although the changes would be small and the effects would be localized.
- *Moderate:* Changes in water quality would be measurable and would be noticeable on a widespread scale.
- *Major:* Changes in water quality would be readily measurable, would have substantial consequences, and would be noticed on a regional scale.
- *Short-term:* After implementation, recovery would take less than one year.
- *Long-term:* After implementation, recovery would take longer than one year or effects would be permanent.

Impacts Common to All Alternatives

All alternatives involving construction and/or repair would have minor to negligible, localized, short-term, adverse impacts on water quality from an increase in sedimentation due to the erosion of disturbed soils. The greatest impacts on water quality would occur where construction or ground disturbance is adjacent to streams, rivers or lakes. Mitigation measures would prevent most of the erosion and contain sediment within work areas. Wastewater from all new or rehabilitated buildings would be connected to the existing sanitary sewage systems. Removing woody debris from Snyder Creek could increase sediment and affect water quality. Removing debris during low water periods would result in negligible to minor adverse, short-term impacts on water quality. Increasing the height of the berm at Rising Sun would have no effect on water quality because any material used would be imported to the site. Stabilizing the bluff where historic guest cabins are located above Rose Creek would cause minor short-term, adverse impacts from sedimentation during construction. However, reducing erosion over the long term would reduce sediments associated with water runoff. This action would have a minor long-term, positive impact on water quality. Coordination with the U.S. Army Corps of Engineers would be undertaken and permits acquired for this action.

Impact Analysis For Necessary and Appropriate Services Alternatives

Granite Park Chalet

- **Alternative A – Status Quo/No Action.** The water and sewage systems at Granite Park Chalet are in poor condition and are not functionally adequate for the level of use. Maintaining the existing water and sewage systems under alternative A would result in minor adverse impacts to groundwater.
- **Alternatives B (Preferred) and C.** These alternatives would improve the water and sewage systems at Granite Park Chalet by replacing and expanding restrooms and providing potable water, resulting in minor positive impacts on water quality.

Guided Day Hiking (Cultural/Natural/Recreational)

- **Alternative A – Status Quo/No Action.** Maintaining current guided day hiking services under alternative A would continue to contribute to erosion along trails, thereby increasing sedimentation in nearby streams, rivers and lakes. Adverse impacts on water quality from alternative A would be negligible and localized.

- **Alternative B (Preferred).** Alternative B reduces the potential for soil erosion and consequent sedimentation in streams, rivers and lakes. Negligible adverse impacts on water quality would also occur under this alternative from soil erosion.

Guided Underwater Diving Tours

- **Alternative A – Status Quo/No Action.** This alternative would have no impact on water quality.
- **Alternative B (Preferred).** Providing guided underwater diving activities would negligibly increase sedimentation from erosion at lakeshore staging areas, turbidity from diving activities. Adverse impacts on water quality from guided underwater diving tours would be localized.

Public Showers

- **Alternative A – Status Quo/No Action.** This alternative would have no impact on water quality.
- **Alternative B (Preferred).** Constructing new shower facilities would cause some sedimentation from possible ground disturbance associated with construction, resulting in negligible short-term, adverse impacts on water quality.

Boat Tours and Transportation (Boat Taxi)

- **Alternative A – Status Quo/No Action.** Maintaining current interpretive boat tours on Lakes McDonald and Josephine as well as St. Mary, Two Medicine, Swiftcurrent and Waterton Lakes would continue to result in negligible adverse impacts on water quality from increased turbidity in shallow waters. This action would also result in minor adverse impacts because of point source pollution from petroleum products.
- **Alternative B (Preferred).** Adverse impacts from **added** tour boat services on Lake McDonald and Two Medicine would not dramatically increase. Extending the present dock at Apgar to 40 feet would have minor short-term, adverse impacts on water quality from driving pilings into the lakebed. Alternative B would have negligible to minor adverse impacts on water quality overall.

Horseback Riding and Horse Packing Services

- **Alternative A – Status Quo/No Action (Preferred).** Continuing current horseback riding and horse packing services would continue to cause sedimentation from erosion and nutrient loading from horse manure into streams, rivers and lakes. Overall adverse impacts would be minor to moderate and widespread.
- **Alternative B.** Maintaining the Apgar stables as a base for packing operations while discontinuing trail rides from the stables, and maintaining all other current horseback riding and horse packing services would result in the same minor to moderate adverse impacts as alternative A.
- **Alternative C.** Adding horseback riding in the Two Medicine and St. Mary areas would increase erosion and nutrient loading, resulting in the same adverse impacts as alternative A.
- **Alternative D.** Impacts for this alternative would be the same as under alternative A, except that removing the Lake McDonald stables would greatly reduce runoff from the horse stables in that area. Soils in the Lake McDonald area have porous subsoil, which allows wastes to move rapidly to either the surface or groundwater (Dutton 2001). Therefore, eliminating runoff from horse stables in the Lake McDonald area would cause a localized reduction in nutrient loading and a

positive effect on water quality. Expanding facilities at the Apgar stables, however, would increase nutrient loading from runoff in that area. Nonpoint pollution control measures would be implemented to mitigate impacts, and impacts would be minor to negligible. Sedimentation from constructing new housing at the Apgar stables would have negligible, adverse, short-term impacts on water quality. Eliminating day riders from the McDonald Valley would have positive long-term effects on water quality.

Overall, alternative D would have minor, widespread, adverse impacts as well as a minor positive impact on water quality in the Lower McDonald Creek drainage.

Alternatives A and B would result in an approximately equal amount of adverse impacts on water quality. Alternative C would affect water quality in a greater overall area than would alternatives A, B or D. Alternative D would have both positive and adverse impacts on water quality, with the least overall adverse impact on water quality.

Conclusion

Granite Park Chalet alternative A would continue to have minor, localized, long-term, adverse impacts on water quality due to poor water and sewage system conditions. Alternatives B and C would improve existing water and sewage system conditions, resulting in a minor, localized, long-term, positive impact on water quality.

Although impacts on water quality under alternative B for guided day hiking services would be slightly less than under alternative A, both alternatives would increase sedimentation. This increase would result in overall negligible, localized, long-term, adverse impacts on water quality.

Alternative A for guided underwater diving tours would have no impact on water quality. Alternative B would have overall negligible, localized, long-term, adverse impacts on water quality from pollution.

Alternative A for public showers would have no impact on water quality. Alternative B for public showers would have negligible, site-specific, short-term, adverse impacts on water quality from sedimentation.

Continuing to provide current boat tours and transportation (boat taxi) under alternative A would continue to have negligible, localized, long-term, adverse impacts on water quality. These impacts would be the same under alternative B.

Alternatives A and B for horseback riding and packing services would have minor to moderate, localized, long-term, adverse impacts due to sedimentation from erosion and nutrient loading from horse manure. Impacts for alternative C would be the same as for alternative A, with the addition of localized impacts in the Two Medicine and St. Mary areas. Alternative D would have the same adverse impacts as alternative A. The removal of the Lake McDonald stables, elimination of day rides in the Upper McDonald Valley and expansion of the Apgar stables would have an overall minor, localized, long-term, positive impact in the Lower McDonald Creek drainage.

There would be no significant adverse impacts on water resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning

documents. Consequently, there would be no impairment of water resources as a result of the implementation of any of the alternatives.

Apgar Village Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Baseline improvements and repairs would have minor, short-term adverse impacts during implementation.



Sedimentation would occur during the stabilization of the Lake McDonald shoreline and result in minor, short-term, adverse impacts on water quality. However, stabilizing the shoreline would reduce sedimentation from erosion over the long-term, resulting in a minor, localized, positive impact on water quality.

Formalizing and hardening pedestrian pathways along the shoreline would reduce a negligible amount of lakeside soil and vegetation available to filter sediments and pollutants in runoff from the surrounding developed area. Developing hardened pathways along the shoreline would increase localized runoff and would have a negligible adverse impact on water quality.

- **Alternative B (Preferred).** Impacts described under alternative A also apply to this alternative.

Removing parking and creating a pedestrian green space in Area I along Lake McDonald would increase the amount of vegetation and soil available to filter sediments and pollutants in water runoff from the surrounding pavement, resulting in a minor positive impact on water quality.

Proposed new parking lots in Areas I and II would be designed to move parking away from the side of Apgar Loop Road. The total amount of non-point source pollution from vehicles would not increase significantly. Hardened, impermeable surfaces reduce the amount of soil and vegetation available to filter runoff, thereby increasing pollution; however, drainage control measures would capture and dissipate runoff to minimize impacts on water quality. Adverse impacts on water quality would be minor and long-term.

- **Alternative C.** Applicable impacts described for alternatives A and B remain the same under this alternative with the following exceptions.

Removing the Village Inn and associated parking from the lakeshore in Area I and restoring the site would increase the amount of vegetation and soil available to filter sediments and pollutants in water runoff from the developed area, resulting in a moderate positive impact on water quality. Although the site would be restored, the area along the lakeshore would be rehabilitated for public use. Consequently, adverse impacts from developing hardened paths along the shoreline would also be negligible since a greater amount of vegetation and soil in the surrounding area would be available to filter sediments and pollutants in water runoff.

Constructing new lodging units and parking in Area II to replace the Village Inn would not increase sediments or pollutants. Moving guest lodging away from the lakeshore would increase the amount of available vegetation and soil to filter sediments and pollutants from water runoff

before it reaches the lakeshore. Also, drainage control measures would be implemented to capture and dissipate runoff and minimize impacts on water quality. Although the new lodging would continue to have minor adverse impacts associated with sediments and pollutants in water runoff, overall impacts from moving development away from the lakeshore would be positive.

- **Conclusion.** Although alternative A would have positive and negative impacts on water quality, the overall impact would be minor to negligible, localized, long-term and adverse.

Alternative B would also have both positive and negative impacts on water quality. However, overall impacts from new development in the Apgar Village developed area would be minor, localized, long-term, and adverse.

Alternative C would have the greatest amount of new development but would have the least negative impact on water quality over the long-term because development is moved away from the lake. This action, and restoring the vegetation and soil would result in an overall minor, localized, long-term, positive impact on water quality.

There would be no significant adverse impacts on water resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of water resources as a result of the implementation of any of the alternatives.

Lake McDonald Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Baseline improvements and repairs would have minor to negligible, short-term, adverse impacts on water quality during implementation.

Formalizing and hardening pedestrian pathways throughout Areas I and II would increase the amount of hardened surfaces in the area. Sediments and pollutants associated with increased water runoff from expanded hardened surfaces would cause negligible to minor, adverse impacts on water quality.

- **Alternative B.** Impacts described under alternative A also apply to this alternative.

Constructing additional parking in Areas I and II would increase the amount of localized runoff due to additional hardened, impermeable surface area. New parking would also increase non-point source pollution from vehicles. With the implementation of drainage control measures to capture and dissipate runoff, adverse impacts would be minor.

Constructing a new housing village for employees in Area II would increase sediments and pollutants associated with water runoff. Drainage control measures would capture and dissipate runoff to minimize impacts on water quality, and adverse impacts on water quality would be minor and long-term.

Removing the existing Coffee Shop parking lot and Girls' Dormitories 1 and 2 from Area II and replacing them with open green spaces would increase the amount of soil and vegetation available

to filter sediments and pollutants from water runoff, having a negligible to minor, positive impact on water quality.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B remain the same under this alternative with the following exceptions.

Constructing a new access road and parking adjacent to the guest cabin units in Area II would increase the amount of hardened surfaces in the area. Sediments and pollutants associated with increased water runoff from expanded hardened surfaces would cause minor adverse impacts on water quality.

- **Conclusion.** Overall, alternative A would have a negligible to minor, localized, long-term, adverse impact on water quality from developing hardened paths.

Although alternative C would have the greatest amount of new development and increase in hardened surfaces, alternatives B and C would both have overall minor, localized, long-term, adverse impacts on water quality.

There would be no significant adverse impacts on water resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of water resources as a result of the implementation of any of the alternatives.

Rising Sun Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained, and maintenance of existing visitor facilities would be ongoing. Baseline improvements and repairs would have minor to negligible, short-term, adverse impacts during implementation.

Formalizing and hardening pedestrian pathways throughout Areas I, II and III would increase the amount of hardened surfaces in the Rising Sun developed area. Sediments and pollutants associated with increased water runoff from expanded hardened surfaces would cause negligible to minor, adverse impacts on water quality.

- **Alternative B.** Impacts described under alternative A also apply to this alternative.

Constructing five new cabins with parking in Area I, as well as a new employee dormitory with parking and an outdoor recreation facility would increase sediments and pollutants associated with water runoff. Drainage control measures would capture and dissipate runoff to minimize impacts, and impacts would be negligible.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B remain the same under this alternative with the following exceptions.

Constructing ten new cabins and associated parking, as well as two new employee dormitories, including an outdoor recreation facility in Area I would increase localized runoff due to new development and additional impermeable surface area. Drainage control measures would capture

and dissipate runoff to minimize impacts on water quality, and adverse impacts on water quality would be negligible.

Reinforcing the existing earth berm in Area II would curtail erosion over the long-term, reducing sediments associated with water runoff and resulting in negligible positive impacts on water quality.

- **Conclusion.** Overall, alternative A would have a negligible to minor, localized, long-term, adverse impact on water quality from developing hardened paths.

Although alternative B would have both positive and negative impacts, overall impacts would be negligible, localized, long-term and adverse from development and increased hardened surfaces in the Rising Sun developed area.

Alternative C would have the greatest overall positive and negative impacts on water quality. Although alternative C would result in more development and a greater increase in hardened surfaces than would alternative B, overall adverse impacts from development under this alternative would also be negligible, localized and long-term. There would be more erosion-reducing actions under alternative C than under alternative B, and positive impacts on water quality from reduced sediments in water runoff would be minor, localized and long-term.

There would be no significant adverse impacts on water resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of water resources as a result of the implementation of any of the alternatives.

Two Medicine Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Baseline improvements and repairs would result in minor to negligible, short-term adverse impacts during implementation.
- **Alternative B (Preferred).** Impacts described under alternative A also apply to this alternative.

Constructing hardened, accessible walkways throughout the Two Medicine developed area, including a pedestrian bridge over Appistoki Creek and accessibility upgrade to the ticket booth office, would increase the amount of hardened surfaces in the area. Sediments and pollutants associated with increased water runoff from expanded hardened surfaces would cause minor adverse impacts on water quality.

The comfort station would be removed and a new one constructed at a new location. This action and constructing a service road and service/bus parking area for the General Store would also have minor adverse impacts from an increase in localized runoff due to the additional hardened, impermeable surface area; however, drainage control measures would be used to minimize impacts on water quality.

Restoring historic landscape features in front of the General Store, including the former comfort station site, would increase the availability of soil and vegetation to filter sediments and pollutants from water runoff. Because a relatively small area would be restored, this action would have negligible positive impacts.

- **Conclusion.** Overall, alternative A would have minor to negligible, localized, short-term, adverse impacts on water quality from baseline repairs and improvements.

Alternative B would have an overall minor, localized, long-term, adverse impact on water quality due to increased hardened surfaces in the developed area.

There would be no significant adverse impacts on water resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of water resources as a result of the implementation of any of the alternatives.

Many Glacier Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Baseline improvements and repairs would have minor to negligible, short-term adverse impacts during implementation.

Formalizing and hardening pedestrian pathways throughout Areas I and II would increase the amount of hardened surfaces in the Many Glacier developed area. Sediments and pollutants associated with increased water runoff from expanded hardened surfaces would cause negligible to minor adverse impacts on water quality.

- **Alternative B.** Impacts described under alternative A also apply to this alternative.

Improving pedestrian access to and around the hotel could increase hardened surfaces in the area. Increased runoff from additional hardened surfaces would cause negligible to minor adverse impacts.

Developing a hardened trail around Swiftcurrent Lake would increase sediments and pollutants associated with water runoff from the additional hardened, impermeable surface area, causing minor adverse impacts on water quality.

See the Swiftcurrent Developed Area below for impacts on water quality from constructing additional employee accommodations in the Swiftcurrent area.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B remain the same under this alternative with the following exceptions.

Constructing a new dormitory and outdoor recreational facility in Area II would increase sediments and pollutants associated with water runoff. Because drainage control measures would be implemented to minimize impacts on water quality, adverse impacts on water quality would be minor and long-term.

- **Conclusion.** Overall, alternative A would have a negligible to minor, localized, long-term, adverse impact on water quality from developing hardened paths.

Although alternative B would have both positive and negative impacts, development and increased hardened surfaces would result in minor, localized, long-term and adverse overall impacts.

Alternative C would have the greatest overall adverse impact on water quality. Constructing a new dormitory with an outdoor recreational facility under this alternative would result in more development and hardened surfaces in the Many Glacier developed area than would alternative B. However, because sediments and pollutants associated with runoff would not increase dramatically, adverse impacts for alternative C would also be minor, localized and long-term.

There would be no significant adverse impacts on water resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of water resources as a result of the implementation of any of the alternatives.

Swiftcurrent Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Baseline improvements and repairs would have minor to negligible, short-term adverse impacts during implementation.
- **Alternative B (Preferred).** Impacts described under alternative A also apply to this alternative.

Formalizing the trail network throughout Areas I, II and III to better separate vehicle and pedestrian circulation could increase hardened surfaces in the Swiftcurrent developed area. Sediments and pollutants associated with increased water runoff from expanded hardened surfaces would cause negligible to minor adverse impacts on water quality. Drainage control structures would be used to minimize impacts.

Constructing a fourth motel in Area I, three new cabin rings on the former Bath House and Motel 4 site in Area II, and approximately five new cabins to complete the existing cabin rings in Area II would increase sediments and pollutants associated with water runoff. Because drainage control measures would be implemented to capture and dissipate runoff and minimize impacts, adverse impacts on water quality would be minor.

Realigning the west access road in Area III, constructing additional visitor parking, and formalizing employee parking adjacent to the Restaurant/Store would develop additional hardened surfaces resulting in minor adverse impacts from increased runoff. Drainage control measures would be used to minimize impacts. Creating a new trailhead at the main parking area and a trail to the existing trailhead would cause increased sedimentation from erosion, but would have a negligible impact on water quality.

- **Alternative C.** Applicable impacts described for alternatives A and B remain the same under this alternative with the following exceptions.

This alternative would construct new employee dormitories, showers, and indoor and outdoor recreation facilities. It would expand employee parking, construct a new cabin ring for employee housing and fill in the existing employee cabin ring with one cabin. These actions would increase sediments and pollutants associated with water runoff from new development and the increased amount of hardened surfaces. However, drainage control measures would be implemented, and impacts on water quality would be minor.

- **Conclusion.** Overall, alternative A would have minor to negligible, localized, short-term, adverse impacts on water quality from baseline repairs and improvements in the Swiftcurrent area.

Alternatives B and C, overall, would result in roughly the same amount of impact. Both alternatives would have an overall minor, localized, long-term, adverse impact on water quality from new development and the increased amount of hardened surfaces.

There would be no significant adverse impacts on water resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of water resources as a result of the implementation of any of the alternatives.

Cumulative Impacts

In areas throughout and adjacent to the park, water resources have been affected by a variety of past actions such as development, and are being affected by present actions such as rafting and boating services. Some reasonably foreseeable actions are road and bridge construction and improvement projects, and U.S. Forest Service timber salvage operations and trail construction outside the park, as well as the Going-to-the-Sun Road rehabilitation project inside the park. These future actions would have localized impacts on water quality. The combined impact of all the actions and any of the alternatives would be a minor long-term, regional, adverse cumulative effect on water resources.

FLOODPLAINS

Methodology

Floodplain literature reviews for the six developed areas (Apgar Village, Lake McDonald, Rising Sun, Two Medicine, Many Glacier and Swiftcurrent) were conducted by a contractor during the fall of 2001. The National Park Service Water Resources Division surveyed the areas in the summer of 2002 to determine where floodplains occur and to what extent floods would occur. The floodplain literature reviews showed that all of the developed areas are adjacent to streams or lakes, and existing facilities might be located within a floodplain.

Thresholds of impact are defined in Table 4.1.



- *Negligible:* Floodplains would not be affected, or changes would be either non-detectable or if detected, would have effects that would be considered slight and site-specific.
- *Minor:* Changes in floodplains would be measurable, although the changes would be small and the effects would be localized.
- *Moderate:* Changes in floodplains would be measurable, but would be site-specific.
- *Major:* Changes in floodplains would be readily measurable, would have substantial consequences, and would be noticed on a localized scale.
- *Short-term:* After implementation, recovery would take less than one year.
- *Long-term:* After implementation, recovery would take longer than one year or effects would be permanent.

Impact Analysis For Necessary and Appropriate Services Alternatives

Other Services

None of the other services alternatives would affect floodplains.

Apgar Developed Area

- **Alternative A – Status Quo/No Action.** There would be no effects on floodplains because the developed area is outside the 100-year floodplain of McDonald Creek. Stabilization of the shoreline would have no effect on the floodplain.
- **Alternative B (Preferred).** There would be no effects on floodplains since the developed area lies outside the 100-year floodplain of McDonald Creek.
- **Alternative C.** There would be no effects on floodplains.

Lake McDonald Developed Area

- **Alternative A - Status Quo/No Action.** Since no additional development is proposed under this alternative, there would be no additional effects on the floodplain of Snyder Creek.
- **Alternative B.** Removal of dormitories located on the west bank of Snyder Creek would have minor long-term, beneficial effects on the floodplain by removing structures from the floodplain and providing unimpeded flows of flood waters.
- **Alternative C (Preferred)** would have the same effects as Alternative B.

Rising Sun Developed Area

- **Alternative A - Status Quo/No Action.** Raising the berm and stabilizing the bank would have a moderate localized, long-term, adverse impact on the floodplain by controlling flood flows.
- **Alternative B** would have the same effects as Alternative A.
- **Alternative C (Preferred)** would have the same effects as Alternative A.

Two Medicine Developed Area

- **Alternative A - Status Quo/No Action.** Maintaining the present channel of Appistoki Creek would have a moderate localized, long-term, adverse impact on the floodplain by controlling flood flows.
- **Alternative B** would have the same effects as Alternative A.

Many Glacier Developed Area

- **Alternative A - Status Quo/No Action.** No effects would occur to the floodplain of Swiftcurrent Lake.
- **Alternative B** would have the same effects as Alternative A.
- **Alternative C (Preferred)** would have the same effects as Alternative A.

Swiftcurrent Developed Area

- **Alternative A - Status Quo/No Action.** No effects on the floodplain would occur.
- **Alternative B (Preferred).** No effects on the floodplain would occur.
- **Alternative C.** No effects on the floodplain would occur.

Conclusion

Proposed improvements and actions taken to protect human life and property at Lake McDonald, Rising Sun, Many Glacier and Two Medicine would have no effect at Many Glacier and moderate, localized, long-term effects at Rising Sun and Two Medicine. There would be minor beneficial, long-term effects at Lake McDonald.

Cumulative Impacts

Actions of maintaining development in floodplains combined with past actions would result in continued control and floods in these areas, resulting in a major adverse, long-term impact.

There would be no significant adverse impacts on floodplains whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of floodplains as a result of the implementation of any of the alternatives.

SOILS**Methodology**

Current soil conditions were assessed through consultation with Glacier National Park staff and professional soils scientists. Alternatives were evaluated on the basis of data and other information gathered from the



following sources: “Soils of Glacier National Park,” prepared by Barry Dutton (2001); Geographic Information System (GIS) thematic layers available through the park’s GIS coordinator, interviews with technical experts, monitoring reports and current literature reviews. Data from recent field surveys were used along with information from other compliance documents.

The following criteria were used to assess impacts: soil removal, soil profile mixing, soil compaction, soil erosion, soil contamination and soil restoration.

Thresholds of impact are defined in Table 4.1.

- *Negligible:* Effects on soils would be below or at the lower levels of detection. Any effects on soil productivity or fertility would be slight.
- *Minor:* Effects on soils would be detectable. Effects on soil productivity or fertility would be small, as would the area affected.
- *Moderate:* Effects on soil productivity or fertility would be readily apparent, and effects would result in a change to soil character over a relatively wide area or at multiple locations.
- *Major:* Effects on soil productivity or fertility would be readily apparent and would substantially change the character of soil resources over a very large area.
- *Short-term:* After implementation, would recover in less than 3 years.
- *Long-term:* After implementation, would take more than 3 years to recover or effects would be permanent.

Impacts Common to All Alternatives

For alternatives involving construction and/or repair, compaction from equipment and erosion would result in negligible site-specific, short-term, adverse impacts during construction. In all alternatives that involve the construction of parking lots, paving and construction would have negligible long-term, site-specific, adverse impacts on soils. Stabilizing the bluff where historic guest cabins are located above Rose Creek would curtail erosion in this area, resulting in minor positive impacts. Reinforcing the existing earth berm in Area II would curtail erosion, resulting in minor positive impacts on soils.

Impact Analysis For Necessary and Appropriate Services Alternatives

Granite Park Chalet

- **Alternative A – Status Quo/No Action.** Alternative A would continue to have minor adverse impacts on soils from trampling and soil hardening caused by visitor movement between the chalet and the drinking water source.
- **Alternative B (Preferred).** The replacement of the water line and installation of a new water tank would temporarily disturb approximately 4,250 square feet of previously disturbed soils. Placement of a new toilet facility and the replacement of associated components would permanently disturb approximately 634 square feet of soil. Repairing the existing infiltration gallery and replacing the water line, water tank and toilet facilities would reduce system maintenance, thereby decreasing the amount of soil disturbance and potential soil contamination. Overall impacts on soils would be minor, long-term and positive.

- **Alternative C** would have the same impacts as alternative B. In addition, the construction of a new gray water system would result in slightly more ground disturbance. System placement would result in 1,500 additional square feet of soil disturbance.

Guided Day Hiking (Cultural/Natural/Recreational)

- **Alternative A – Status Quo/No Action.** Continuing current guided day hiking services would result in continued adverse impacts on soils due to increased soil compaction and erosion, and decreased soil productivity along trails. Large guided hiking groups contribute to greater erosion and compaction because of the tendency groups to step off the trail when gathering around the guide, or to allow others to pass by.
- **Alternative B (Preferred)** would place group size limits on guided day hikes and on the number of trips per day on high-traffic trails. This would reduce the potential for soil erosion and compaction surrounding the trail. Alternative B would have a less negative impact than alternative A.

Firewood Sales

- **Alternative A – Status Quo/No Action** would have no impact on soils because firewood sales do not occur in campgrounds.
- **Alternative B (Preferred).** Providing firewood sales in specific campgrounds in the visitor services zone would have no effect on soils unless new facilities were constructed to facilitate sales. The placement of new facilities would likely be limited to existing developed areas and would cause negligible adverse impacts from construction.

Public Showers

- **Alternative A – Status Quo/No Action** would have no impact on soils.
- **Alternative B (Preferred).** New shower facilities would likely be constructed in relatively small areas that are within previously developed areas at or near campgrounds in the visitor services zone. This action would cause negligible adverse impacts from disturbance due to construction and the permanent placement of structures on the soil surface.

Boat Tours and Transportation (Boat Taxi)

- **Alternative A – Status Quo/No Action.** Continued soil disturbance and turbidity in shallow waters, as well as negligible soil contamination from petroleum products would persist at Lakes McDonald and Josephine, and St. Mary, Two Medicine, Swiftcurrent, and Waterton Lakes.
- **Alternative B (Preferred).** This alternative would have the same impacts as alternative A, but with increased adverse impacts on Lake McDonald due to added tour boat services from Apgar Village to Lake McDonald Lodge.

Horseback Riding and Horse Packing Services

- **Alternative A – Status Quo/No Action (Preferred).** Continuing current horseback riding and horse packing services would continue to erode and compact soil, and decrease productivity along trails, resulting in minor adverse impacts. Nonpoint source pollution from horse stables would

continue to contribute to soil contamination.

- **Alternative B.** Maintaining the Apgar stables as a base for packing operations while discontinuing trail rides from the stables, and maintaining all other current horseback riding and horse packing services would result in the same minor adverse impacts as alternative A, except that the elimination of commercial horseback riding day trips from the Apgar stables would reduce impacts along Apgar area trails.
- **Alternative C.** Adding horseback riding in the Two Medicine and St. Mary areas would result in the same adverse impacts as alternative A, but with a slight increase in erosion and compaction, and decrease in soil productivity along trails in the Two Medicine and St. Mary areas.
- **Alternative D.** Impacts would be the same as under alternative A, except that removing the Lake McDonald stables and discontinuing day rides in the Upper McDonald Valley would reduce soil contamination in that area, resulting in a positive impact. Soils in the Lake McDonald area have a porous subsoil, which allows wastes to move rapidly to surface or groundwater (Dutton 2001). Consequently, these soils are not well suited for horse use due to the high potential of nitrogen in soils from horse manure. Expanding the Apgar stables and possibly constructing additional housing could result in minor adverse impacts from some increased soil disturbance due to construction and permanent placement of structures in that area.

Conclusion

Alternative A for Granite Park Chalet would continue to have minor, site-specific, long-term, adverse impacts due to soil contamination and periodic disturbance from maintenance. Generally, although alternative B would result in slightly more ground disturbance than alternative C, both alternatives would have overall minor, site-specific, long-term, positive impacts on soils due to decreased soil contamination.

While alternative A for guided day hiking would continue minor long-term, localized, adverse impacts on soils from soil compaction and erosion, alternative B would have negligible long-term, localized, adverse impacts.

Alternative A for firewood sales would have no impact on soils. If new facilities are constructed for firewood sales under alternative B, impacts from disturbance to soils would be negligible long-term, site-specific, and adverse.

Alternative A for public showers would have no impact on soils. Alternative B would have negligible long-term, site-specific, adverse impacts on soils from ground disturbance.

Continuing to provide current boat tours and transportation (boat taxi) under alternative A would continue the negligible to minor long-term, adverse impacts specific to Lakes McDonald and Josephine, and St. Mary, Two Medicine, Swiftcurrent, and Waterton Lakes. These impacts would increase under alternative B due to added tour boat services, resulting in minor long-term, site-specific, adverse impacts.

Alternatives A and B for Horseback Riding and Horse Packing Services would result in an approximately equal amount of adverse impacts on soils, except that impacts along Apgar area trails would be less under alternative B. Alternatives A and B would have minor long-term, localized, adverse impacts from compaction and erosion due to horse use on trails. Soil contamination would

result in minor long-term, site-specific, adverse impacts. Impacts for alternative C would be the same as for alternative A, with the addition of localized impacts from erosion and compaction in the Two Medicine and St. Mary areas. Alternative C would affect a greater overall area of soils along trails than would alternative A, B or D. Alternative D would have the same impacts as alternative A. In addition, the removal of the Lake McDonald stables would have minor long-term, site-specific, positive impacts, while potential new development in the Apgar stables area would result in minor long-term, site-specific, adverse impacts. Permanent placement of new structures in alternative D would adversely impact a greater amount of soils than would the other alternatives.

There would be no significant adverse impacts on soils whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of soils as a result of the implementation of any of the alternatives.

Apgar Village Developed Area

- **Alternative A – Status Quo/No Action.** Improvements and repairs would have negligible short-term, adverse impacts during implementation.

Stabilizing the Lake McDonald shoreline and addressing basic erosion issues along the lakefront would reduce shoreline soil erosion, resulting in minor positive impacts. Stabilization activities would cause some short-term adverse impacts from sedimentation into Lake McDonald.

- **Alternative B (Preferred).** Impacts described under alternative A also apply to this alternative. In addition, alternative B would develop approximately 2.5 acres of soil and restore over 0.5 acre of previously disturbed soil. All impacts would occur within the existing developed area.

Creating a pedestrian green space in Area I along Lake McDonald would restore approximately 0.5 acre of soil, resulting in a minor positive impact on soils.

Permanent placement of parking lots in Areas I and II would disturb soil and cause long-term loss of productivity of approximately 2.5 total acres of soil, resulting in minor adverse impacts. New parking would be designed to move parking away from the Apgar Loop roadside rather than increase the total amount of parking in the village. The area along Apgar Loop Road currently used for parking would be restored, resulting in a positive impact on soils along the roadside. The total amount of nonpoint source pollution from vehicles would not increase significantly, and there would be no increase in soil contamination. Nonpoint source pollution controls would be implemented.

Constructing trails and walkways throughout the village would disturb ground and compact soil, resulting in negligible adverse impacts. However, the development of main trails would discourage the use of multiple social trails, thereby reducing overall erosion and compaction of soils throughout the Apgar Village area and resulting in a positive impact.

Extending the operating season of the Village Inn eight weeks (three weeks earlier and five weeks later) could affect soil resources by concentrating more people along the shoreline and riparian areas when soils are saturated early in the year. This concentration could result in compaction,

unwanted “social trails” and if vegetation were lost, soil erosion. The effects would be negative, minor and long-term.

- **Alternative C.** Alternative C would develop a total of approximately 5.5 acres of soil and restore approximately 1.75 acres of soils. All disturbances would occur within the existing developed area. Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative with the following exceptions.

Removing the Village Inn and associated parking from Area I and rehabilitating the site for public space would restore approximately 0.75 acre of soils, resulting in minor positive impacts.

Constructing new lodging units and parking in Area II to replace rooms lost from the Village Inn would cause disturbance. It would also cause the long-term loss of soil productivity of approximately 2.5 acres of soil within the existing developed area, resulting in minor adverse impacts.

Permanent additional boat ramp parking in Area I would disturb soil and cause long-term loss of productivity of approximately 0.5 total acre, resulting in minor adverse impacts.

Removing the environmental education cabin from Area II would restore less than 0.5 acre of soils, resulting in a positive impact. Extending a bicycle path adjacent to Area II to the campground would result in some adverse impacts on soils in the immediate area due to paving and soil compaction. Impacts would be negligible if the path follows the existing utility corridor and social trail.

Permanent additional boat ramp parking in Area I would disturb soil and cause long-term loss of productivity of approximately 0.5 total acre, resulting in minor adverse impacts.

- **Conclusion.** Although improvements and repairs would have negligible short-term, site-specific, adverse impacts, alternative A would have an overall minor long-term, site-specific, positive impact.

Overall, alternative B would restore soils and stabilize the shoreline, creating a minor long-term, site-specific, positive impact. Development of soils would result in negligible long-term, site-specific, adverse impacts. Extending the operating season for both alternatives B and C would have minor negative, long-term impacts.

Alternative C would have the greatest overall impact on soils. It would cause substantially more ground disturbance and soil restoration than alternative A or B. Although alternative C would restore a greater overall amount of soils than would alternative A or B, overall positive impacts under this alternative would also be minor, long-term and site-specific. Overall adverse impacts under alternative C would be minor, long-term and site-specific.

Shoreline stabilization and soil restoration within the Wild and Scenic River corridor and Apgar Village developed area would have significant positive impacts.

None of the alternatives would adversely affect rare or sensitive soils. There would be no significant adverse impacts on soils whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the

General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of soils as a result of the implementation of any of the alternatives.

Lake McDonald Developed Area

- **Alternative A – Status Quo/No Action.** Improvements and repairs would have negligible short-term, adverse impacts during implementation. Improvements to the exterior surfaces of some existing structures might involve the removal of lead-based paint, which could contaminate soils in the area surrounding the structures. Proper mitigation measures would ensure that adverse impacts would be negligible and short-term.

Some ground disturbance, soil compaction and the permanent placement of walkways from constructing new accessible trails and walkways throughout the area would have negligible adverse impacts on soils because the trails and walkways would take advantage of current social trails. The development of main trails would also have a positive impact by discouraging the use of multiple social trails, thereby reducing overall erosion and compaction of soils throughout the Lake McDonald developed area.

- **Alternative B.** Impacts described under alternative A also apply to this alternative. In addition, alternative B would develop approximately 3 acres of soil and restore approximately 0.5 acre of previously disturbed soil. All impacts would occur within the existing developed area.

Constructing new guest and employee parking in Areas I and II would disturb soil and cause long-term loss of productivity of approximately 2 acres because placement of the new parking lots would take advantage of previously disturbed areas; this action would result in negligible adverse impacts. New parking would result in increased nonpoint source pollution from vehicles. However, with the implementation of nonpoint source pollution controls, adverse impacts from soil contamination would be negligible.

Constructing a new housing village for employees in Area II would develop approximately 1 acre of soil, resulting in minor adverse impacts from soil disturbance and long-term loss of soil productivity. Constructing a new public comfort station in Area II would create minimal ground disturbance and negligible adverse impacts.

Removing the Boys' Dormitories 1 and 2 from Area I, the Johnson, Jammer and Hydro Dormitories, and constructing a parking lot, laundry and maintenance facility on part of this site, would restore only a relatively small area of soils. Therefore, positive impacts from removing dormitories in Area I would be negligible. Removing the existing Coffee Shop parking lot and Girls' Dormitories 1 and 2 from Area II and replacing them with open green spaces would restore less than 0.5 acre of soil, resulting in minor positive impacts. Removing the driveway and parking by the cabins in Area II, and dedicating the area to pedestrian use would restore soil in the area. This action would result in less compaction from vehicles, causing minor positive impacts.

Extending the operating season of the Lake McDonald Lodge, General Store, Coffee Shop and other visitor accommodations five weeks (two weeks earlier and three weeks longer) would encourage visitor use along the shoreline and riparian areas when soils are saturated early in the year. The result could be soil compaction, unwanted "social trails" and if vegetation were lost, soil erosion. The effects would be negative, minor and long-term.

- **Alternative C (Preferred).** Alternative C would develop a total of approximately 3 acres of soil and restore approximately 0.5 acre of previously disturbed soil. All disturbance would occur within the existing developed area. Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative with the following exceptions.

Removing the Coffee Shop and constructing a new restaurant with employee dining and post office in Area II would have negligible adverse impacts because the new restaurant would be constructed on previously disturbed soil. Constructing a new access road and parking adjacent to the guest cabin units in Area II would result in negligible adverse impacts because there is currently an access road and informal parking in the area of the cabin units, and minimal new soil disturbance would occur. There is a potential for better erosion control under this alternative that would reduce sediment transport.

- **Conclusion.** Overall, alternative A would have a negligible short-term, site-specific, adverse impact on soils due to minimal disturbance from improvements and repairs.

Alternative B would have an overall minor, long-term, site-specific, positive impact from restoration, and an overall minor, long-term, site-specific, adverse impact from development of soils. Extending the operating season for both alternatives B and C would have minor negative, long-term impacts.

Alternative C would cause the greatest overall amount of new disturbance to soils, but just slightly more soil disturbance than alternative B. Development under alternative C would have an overall minor, long-term, site specific, adverse impact. Alternative C would restore approximately the same amount of soil as would alternative B, resulting in an overall minor, long-term, site specific, positive impact.

None of the alternatives would adversely affect rare or sensitive soils. There would be no significant adverse impacts on soils whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of soils as a result of the implementation of any of the alternatives.

Rising Sun Developed Area

- **Alternative A – Status Quo/No Action.** Soils have been previously disturbed throughout the Rising Sun developed area, and current conditions would be maintained under this alternative. Improvements and repairs would have negligible short-term, adverse impacts during implementation. Improvements to the exterior surfaces of some existing structures might involve the removal of lead-based paint, which could contaminate soils in the area surrounding the structures. However, proper mitigation measures would ensure that adverse impacts would be negligible and short-term.

Some ground disturbance, soil compaction and permanent placement of walkways from constructing new accessible trails and walkways throughout the area would have negligible adverse impacts on soils because the trails and walkways would take advantage of current social trails. However, the development of main trails would discourage the use of multiple social trails,

reducing the overall erosion and compaction of soils throughout the area and resulting in a positive impact.

- **Alternative B.** Alternative B would develop a total of less than 2 acres of soil. All impacts would occur within the existing developed area, and impacts described under alternative A also apply to this alternative.

Constructing five new cabins with parking, a new employee dormitory with parking and an outdoor recreation facility, and a second boat concessioner employee cabin in Area I would result in disturbance and long-term loss of soil productivity of less than 2 acres of soil. Since Area I has been previously developed, this new construction would have negligible adverse impacts.

Extending the operating season of the visitor overnight accommodations, Coffee Shop and General Store/Motel/Dormitory five weeks (three weeks earlier and two weeks longer) would encourage earlier visitor use in areas where soils might still be saturated and susceptible to compaction, and if vegetation were lost, to erosion. The effects would be negative, minor and long term.

- **Alternative C (Preferred).** Alternative C would develop a total of over 2 acres of soil, and all disturbance would occur within the existing developed area. Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative with the following exceptions.

Constructing ten new cabins and associated parking, and two new employee dormitories including an outdoor recreation facility, in Area I would develop less than 4 acres of soil. Since Area I has been previously developed, this new construction would have negligible adverse impacts from soil disturbance. Modifying the intersection to the campground would have negligible adverse impacts because minimal soil disturbance would be involved and all disturbance would be immediately adjacent to the existing road.

- **Conclusion.** Overall, alternative A would have a negligible short-term, site-specific, adverse impact due to minimal disturbance from improvements and repairs.

Alternative B would have both positive and negative impacts. It would have an overall negligible, long-term, site-specific, adverse impact from development and an overall minor, long-term, site-specific, positive impact from reduced erosion potential. Extending the operating season for both alternatives B and C would have minor negative, long-term impacts.

Alternative C would have the greatest overall impact on soils. Although alternative C would disturb slightly more soil than alternative B, overall negative impacts from development under this alternative would also be minor, long-term, and site-specific. There would be more action to reduce erosion under alternative C than under alternative B; however, beneficial impacts under this alternative would also be minor, long-term and site-specific.

None of the alternatives would adversely affect rare or sensitive soils. There would be no significant adverse impacts on soils whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of soils as a result of the implementation of any of the alternatives.

Two Medicine Developed Area



- **Alternative A – Status Quo/No Action.** Soils have been previously disturbed throughout the Two Medicine developed area, and current conditions would be maintained under this alternative. Improvements and repairs would have negligible short-term, adverse impacts during implementation.
- **Alternative B (Preferred).** Impacts described under alternative A also apply to this alternative. In addition, alternative B would develop less than 2 acres of soil and restore as much as 0.5 acre of previously disturbed soil. All impacts would occur within the existing developed area.

Some ground disturbance, soil compaction and permanent placement of walkways from constructing new accessible trails and walkways throughout the area, including a pedestrian bridge over Appistoki Creek, would have negligible adverse impacts on soils because the trails and walkways would take advantage of current social trails. The development of main trails would also have a positive impact on soils by discouraging the use of multiple social trails, thereby reducing overall erosion and compaction of soils throughout the area.

The comfort station would be removed and a new one constructed at a new location in Area I, restoring soils at the former site and developing less than 0.5 acre at the new comfort station location. This minimal ground disturbance would have negligible adverse impacts. Restoring historic landscape features in front of the General Store, including the former comfort station site, would restore approximately 1 acre of soil, resulting in minor positive impacts.

Extending the operating season for the General Store four weeks (one week earlier and three weeks later) would encourage visitor use earlier in the season when soils would be saturated and susceptible to damage. The effects would be negative, negligible and long-term.

- **Conclusion.** Overall, alternative A would have negligible short-term, site-specific, adverse impacts from repairs and improvements.

Alternative B would have an overall positive impact. Although this alternative would result in negligible long-term, site-specific, adverse impacts from ground disturbance and extending the operating season, soil restoration would have overall minor long-term, positive, and site-specific impacts.

None of the alternatives would adversely affect rare or sensitive soils. There would be no significant adverse impacts on soils whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of soils as a result of the implementation of any of the alternatives.

Many Glacier Developed Area

- **Alternative A – Status Quo/No Action.** Soils have been previously disturbed throughout the Many Glacier developed area, and current conditions would be maintained under this alternative. Improvements and repairs would have negligible short-term, adverse impacts during implementation.

Some ground disturbance, soil compaction and permanent placement of walkways from constructing new accessible trails and walkways throughout the area would have negligible adverse impacts on soils because the trails and walkways would take advantage of current social trails. The development of main trails would also have a positive impact on soils by discouraging the use of multiple social trails, thereby reducing overall erosion and compaction of soils throughout the area.

- **Alternative B.** This alternative would develop approximately 1 acre of soil. Less than 0.5 acre of soil would be restored. All impacts would occur within already developed areas, and impacts described under alternative A also apply to this alternative.

Rehabilitating the approach road, including screening and parking modifications in Area I would disturb a minimal amount of soil, most of which has been previously disturbed. Adverse impacts to soils would be negligible. Limiting access on the service road and landscaping the surrounding area would improve soil conditions along the lakeshore, resulting in minor positive impacts. Improving pedestrian access to and around the hotel would reduce the use of multiple social trails in the area, thereby reducing overall erosion and compaction of soils, and resulting in minor positive impacts.

Developing an accessible trail around Swiftcurrent Lake would result in the permanent placement of a hardened surface along the trail. Because the trail is currently heavily traversed, new impacts would be negligible.

Constructing an information/orientation pull-off on Many Glacier Road could potentially cause new soil disturbance. Depending on the location and amount of disturbance, adverse impacts could range from negligible to moderate.

For impacts on soils from constructing additional employee accommodations in the Swiftcurrent developed area, see the Swiftcurrent Developed Area below.

Extending the operating dates of the Many Glacier Hotel and other accommodations two weeks (one week earlier and one week later) would encourage visitor use earlier in the season when soils might still be saturated, and susceptible to compaction and if vegetation were lost, to erosion. The effects would be negligible, negative and long term.

- **Alternative C (Preferred).** This alternative would develop approximately 2 acres of soil. Less than 0.5 acre of soil would be restored, and all disturbance would occur within the existing developed area. Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative with the following exceptions.

Constructing a new dormitory and outdoor recreational facility in Area II would develop approximately 1 acre of soil. Some of the area has been previously disturbed and has been used for prior recreational purposes. Adverse impacts would be minor.

- **Conclusion.** Overall, alternative A would have a negligible short-term, site-specific, adverse impact on soils due to minimal disturbance from improvements and repairs.

Alternative B would have both positive and negative impacts on soils. Some soil conditions would be improved from reducing the use of social trails throughout the Many Glacier developed area and restoring some areas with landscape. However, overall, alternative B would have a negligible to minor long-term, site specific, adverse impact depending on how much soil would be disturbed from the construction of a new pull-off along Many Glacier Road.

Alternative C would have the greatest overall adverse impact on soils since more soils would be developed under this alternative than under alternative A or B. Overall adverse impacts would be minor, long-term and site specific. Alternative C would restore the same amount of soils as alternative B. Extending the operating season for both alternatives B and C would have negligible negative, long-term impacts.

None of the alternatives would adversely affect rare or sensitive soils. There would be no significant adverse impacts on soils whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of soils as a result of the implementation of any of the alternatives.

Swiftcurrent Developed Area

- **Alternative A – Status Quo/No Action.** Soils have been previously disturbed throughout the Swiftcurrent developed area, and current conditions would be maintained under this alternative. Improvements and repairs would have negligible short-term, adverse impacts during implementation.
- **Alternative B (Preferred).** Alternative B would affect approximately 4 acres of soil and restore 0.5 acre of previously disturbed soil. All impacts would occur within the existing developed area. Impacts described under alternative A also apply to this alternative.

Reconfiguring the trail network throughout Areas I, II and III to separate vehicle and pedestrian circulation would cause minimal disturbance of new soil and negligible adverse impacts. The development of main trails would discourage the use of multiple social trails, and reduce overall erosion and compaction of soils throughout the area, having a positive impact on soils.

Constructing a fourth motel in Area I would disturb soil and cause long-term loss of productivity of approximately 0.5 acre of soil, resulting in negligible adverse impacts. Constructing three new cabin rings on the former Bath House and Motel 4 site in Area II, and approximately five new cabins to complete the existing cabin rings in Area II disturb soil and cause the long-term loss in soil productivity of approximately 0.5 acre. However, since construction would occur in areas that have been previously developed, adverse impacts would be negligible.

Moving parking from the inside cabin rings to the loop road in Area II would result in both positive and negative impacts. The permanent placement of new parking lots would disturb soil and cause long-term loss of productivity of less than 1 acre of soil, resulting in negligible adverse impacts. There would be a net increase in parking in the Swiftcurrent developed area that would

cause increased nonpoint source pollution from vehicles. However, with the implementation of nonpoint source pollution controls, adverse impacts from soil contamination would be negligible. Also, the areas within the cabin rings where parking currently exists would be restored, resulting in minor positive impacts.

Realigning the west access road in Area III would disturb soil and cause long-term loss of productivity of less than 0.5 acre of soil, resulting in negligible adverse impacts. Constructing additional visitor parking and formalizing employee parking adjacent to the Restaurant/Store in Area III would develop approximately 1 acre of soil, but would use previously developed areas, including the area occupied by the existing access road. Adverse impacts from this action would be negligible. Creating a new trailhead at the main parking area and a trail to the existing trailhead would disturb a minimal amount of soil, and cause increased soil compaction and erosion along the new section of trail. However, adverse impacts would be negligible because of the relatively small area affected.

Extending the operating dates of the visitor accommodations and Restaurant/Store three weeks (two weeks earlier and one week later) would encourage visitor use in areas when soils might still be saturated and susceptible to compaction, and if vegetation is lost, to erosion. The effects would be negative, minor and long term.

- **Alternative C.** Alternative C would develop approximately 5 acres of soil and restore less than 0.5 acre of soil. All disturbance would occur within the existing developed area. Applicable impacts described for alternatives A and B remain the same under this alternative with the following exceptions.

This alternative would construct new employee dormitories, showers, and indoor and outdoor recreation facilities; expand employee parking; construct a new cabin ring for employee housing; and fill in the existing employee cabin ring with one cabin. These actions would develop between 1 and 2 acres of soil in Area II. Since placement of the new employee complex would take advantage of previously developed areas, including the former Bath House site, there would be negligible adverse impacts.

- **Conclusion.** Alternative A would have a negligible short-term, site-specific, adverse impact on soils due to minimal disturbance from improvements and repairs. Extending the operating season for both alternatives B and C would have minor negative, long-term impacts.

Alternative C would result in somewhat more soil disturbance than alternative B, and both alternatives would restore approximately the same amount of soil. Both alternatives would have an overall minor, long-term, site-specific, adverse impact on soils.

None of the alternatives would adversely affect rare or sensitive soils. None of the alternatives would adversely affect rare or sensitive soils. There would be no significant adverse impacts on soils whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of soils as a result of the implementation of any of the alternatives.

Cumulative Impacts

In areas throughout and adjacent to the park, past actions such as development have led to disturbance of park soils, as do ongoing services. This disturbance is within developed areas, along roads and trails, and near lakes and rivers. Reasonably foreseeable projects outside the park such as constructing additional employee housing, improving roads and bridges, U.S. Forest Service timber salvaging and reforestation are small in scope compared to the total area of the region. Impacts on soils from these projects would be either site-specific or localized. The combined impact of all actions both inside and outside the park and any of the alternatives would have a minor long-term, regional, adverse cumulative effect on soils.

VEGETATION

Methodology

Current vegetation conditions were assessed through consultation with the park's staff ecologist and biological technicians, synthesis of research reports and databases, and field surveys conducted during the summer of 2001.

Thresholds of impact are defined in Table 4.1.

- *Negligible*: No native vegetation would be affected or some individual native plants could be affected, but there would be no effect on native species populations. The effects would be on a small scale, and no species of concern would be affected.
- *Minor*: Native plants would be affected over a relatively small area and a minor portion of a species' population.
- *Moderate*: Native plants would be affected over a relatively wide area (greater than 5 acres) or at multiple locations, and would be readily noticeable.
 - *Major*: There would be a widespread effect on native species' populations or a considerable effect on native plant populations, including species of concern, over a very large area (greater than 10 acres).
 - *Short-term*: After implementation, would recover in less than 3 years.
 - *Long-term*: After implementation, would take more than 3 years to recover or effects would be permanent.



Impacts Common to All Alternatives

All construction work would have negligible to minor short-term, site-specific, adverse impacts on vegetation from temporary disturbance and vegetation trampling. Installation of new structures would have minor to moderate long-term, adverse impacts. Besides the extent of vegetation removal, a primary factor in analyzing impacts is the seasonal timing of construction work. Vegetation is most sensitive to trampling and destruction during spring and early summer (March through June) when soils are wettest and plant root

structures are more easily damaged. The next most sensitive time period is the fall season (mid-September through mid-November), when soils are wetter than during summer and plants are, or soon will be inactive. Ground that is disturbed in the fall is subjected to freeze-thaw conditions and springtime erosion caused by thawing before plants have an opportunity to recover through new growth. Ground disturbance during summer (mid-June through mid-September) would occur when soils are relatively dry and vegetation has some growing time to recover.

Greater levels of vegetation disturbance require longer recovery times and cause increased levels of soil erosion and compaction, and increased potential for invasion by exotic plants, including noxious weeds. While vegetation may recover in a short amount of time, the resulting expansion of exotic plant species may be a long-term consequence. The spread of exotic species, including noxious weeds into disturbed areas under any of the alternatives would have a minor to moderate long-term, adverse impact on vegetation, depending on the area of disturbance and the potential area of spread. The revegetation of disturbed areas with native vegetation and implementation of a noxious weed management program would mitigate the spread of noxious weeds. Maintaining or expanding development in any area also alters fire regimes of nearby vegetation communities, as fires are generally extinguished to protect park structures.

Impact Analysis For Necessary and Appropriate Services Alternatives

Granite Park Chalet

- **Alternative A – Status Quo/No Action.** In alternative A, periodic ground disturbance for system maintenance and possible soil contamination would continue to have minor adverse impacts on vegetation. Alternative A would continue to have minor adverse impacts from trampling and vegetation loss from visitors accessing the drinking water source.
- **Alternative B (Preferred).** Water system improvements and toilet construction would disturb approximately 4,250 square feet of ground. Disturbance would occur in herbaceous and shrub cover vegetation types near tree line, dominated by subalpine fir, swamp-gooseberry, slender wheatgrass, mountain hairgrass and smooth woodrush. This grass/forb subalpine meadow vegetation type is fairly common, and typically recovers very slowly from disturbance. Exotic species present in currently disturbed sites around the chalet include timothy, dandelion and Kentucky bluegrass. Some subalpine meadows are very slow to recover from ground disturbance, and may never fully rebound to original plant composition due to soil erosion and compaction, and due to exotic species invasion (Hartley 1999). Ground disturbance would cause minor short-term, adverse impacts on vegetation resources, while vegetation removal would cause minor long-term, adverse impacts. Improving the water and sewage system would also have a minor positive impact on vegetation resources by reducing the frequency of soil contamination and ground disturbance.
- **Alternative C.** This alternative would have the same impacts as alternative B; however, the construction of a new gray water system would result in slightly more ground disturbance and vegetation removal. System placement would result in 1,500 additional square feet of disturbance.

Guided Day Hiking (Cultural/Natural/Recreational)

- **Alternative A – Status Quo/No Action.** Although trained guides offer some enhancement to visitor awareness of sensitive resources and leave-no-trace backcountry travel techniques, the lack of limits to group size or number of trips per day under alternative A could cause increased trailside vegetation trampling and erosion when large groups are assembled. Participants could

crowd trails and erode them into wider trail cuts. This alternative would cause negligible adverse impacts on vegetation resources.

- **Alternative B (Preferred).** This alternative would limit group size for guided day hikes and the number of trips per day on high-traffic trails, thereby reducing the potential for vegetation trampling and soil erosion. Alternative B would also have a negligible adverse impact on vegetation.

Guided Underwater Diving Tours

- **Alternative A – Status Quo/No Action.** This alternative would have no impact on vegetation because guided underwater diving tours would not be available in the park.
- **Alternative B (Preferred).** This alternative would cause negligible adverse impacts on vegetation along informal lakeshore social trails. Although trained guides would direct visitors to appropriate locations, vegetation trampling and soil erosion could occur at staging areas and along social trails associated with guided diving from lakeshores.

Firewood Sales

- **Alternative A – Status Quo/No Action.** Continuing to sell firewood in camp stores would continue to reduce the extent of wood gathering around campgrounds, thereby reducing trampling along social trails surrounding campgrounds. This operation would have a minor beneficial impact on vegetation.
- **Alternative B (Preferred).** Although expanding firewood sales operations at developed campgrounds might entail new ground disturbance, it would also reduce the impacts associated with visitors gathering wood from around the campgrounds. Overall, this reduction in vegetation trampling along social trails surrounding campgrounds would cause minor long-term, beneficial impacts on vegetation resources.

Public Showers

- **Alternative A – Status Quo/No Action.** This alternative would have no impact on vegetation.
- **Alternative B (Preferred).** Impacts from alternative B associated with the construction of new shower facilities would be minor. Relatively small areas would likely be adversely affected.

Guided Interpretive Motor Vehicle Tours and Public Transportation

- **Alternative A – Status Quo/No Action.** The increasing number of vehicles traveling park roads has caused the proliferation of informal roadside social trails and undesignated parking along road shoulders in congested areas. Vegetation trampling and soil erosion along these social trails and at undesignated parking areas has adversely impacted vegetation. It is not known whether the availability of commercial vehicle tours decreases or adds to the number of private vehicles on park roads. Generally, the shuttle and taxi services cause a negligible reduction in the number of private vehicles on park roads. If commercial vehicle tour services decreases the number of private vehicles, then this alternative would continue to cause minor positive impacts by slightly reducing vegetation trampling and soil erosion along roadside social trails. Mitigation measures under this alternative would include requiring tour buses to stop only at designated areas and commercial vehicle tour concessioners to educate visitors about the impacts of social trails on vegetation.

- **Alternative B (Preferred).** Because taxi and private vehicle shuttle services are usually used primarily by visitors without personal vehicles and visitors completing loop hikes, the expansion of these services under alternative B would have a negligible influence on the number of vehicles on park roads. Assuming that the expansion of commercial vehicle tours would decrease the number of private vehicles on park roads, a slight reduction in trampling and erosion along undesignated, roadside social trails and at undesignated overflow parking sites, as well as the education of visitors by tour providers regarding protection of natural resources would result in positive impacts under alternative B.

Horseback Riding and Horse Packing Services

- **Alternative A – Status Quo/No Action (Preferred).** Continuing current horseback riding and horse packing services under alternative A would continue to cause moderate adverse impacts on vegetation due to vegetation trampling and soil erosion. Trampling and destruction of vegetation occurs along designated trails open to horse traffic, especially during the spring and fall periods, when soils are at their wettest and vegetation is most susceptible to damage. Where horse impacts are greatest along high-use trails and at stables and corrals, this disturbance promotes the establishment and spread of noxious weeds. Cutting new trails by hikers and horses in order to avoid deep ruts in high-use trails also causes impacts.
- **Alternative B.** Impacts described for alternative A are the same for alternative B, except that the elimination of commercial horseback riding day trips from the Apgar stables under alternative B would reduce impacts to vegetation along Apgar area trails. Within the Apgar area, the reduction of vegetation trampling, soil erosion and spread of noxious weeds along Apgar area trails would cause minor positive impacts.
- **Alternative C.** Adding horseback riding in the Two Medicine and St. Mary areas would result in the same adverse impacts as alternative A with an increase in vegetation trampling, erosion and spread of noxious weeds along trails. New impacts on vegetation would be minor since additional horseback riding trips would occur only during July, August and September when soils are relatively dry.
- **Alternative D.** Impacts described for alternative A also apply to alternative D, except that the removal of the Lake McDonald Lodge stables and corral would reduce site-specific impacts on vegetation resources. Since there would be trailhead parking and a stock-loading ramp in the area and guided horseback riding day trips would continue on area trails, the removal of the stables and corral would result only in negligible to minor site-specific, positive impacts on vegetation. Although detailed site plans will undergo future analysis, the expansion of facilities at the Apgar stables would likely cause minor adverse impacts due to vegetation removal, increased vegetation trampling, and the increased threat of spreading noxious weeds.

Conclusion

At Granite Park Chalet, possible soil contamination and periodic ground disturbance for system maintenance in alternative A would continue to have minor long-term, site-specific, adverse impacts. Alternatives B and C would have both positive and negative impacts. Generally, although alternative B would result in more ground disturbance than alternative C, both alternatives would have minor long-term, site-specific, adverse impacts from ground disturbance. Improvements to the water and sewage system under both alternatives would cause minor long-term, site-specific, positive impacts.

Although under alternative B, guided day hiking would have a less negative impact on vegetation than alternative A because it limits group sizes and the number of trips per day on high-traffic trails, impacts from trailside vegetation trampling and increased erosion would be negligible long-term, localized, and adverse for both alternatives.

Guided underwater diving tours under alternative A would not be available in the park; therefore there would be no impact on vegetation. In alternative B, vegetation trampling and erosion along informal lakeshore social trails and at staging areas would cause negligible long-term, site-specific, adverse impacts.

Alternatives A and B for firewood sales would reduce trampling from visitors gathering wood, resulting in overall minor long-term, site-specific, positive impacts near campgrounds.

Alternative A for public showers would have no impact on vegetation. In alternative B, vegetation removal associated with the construction of new facilities would have overall minor long-term, site-specific, adverse impacts.

Assuming that guided interpretive motor vehicle tours and public transportation services reduce the number of private vehicles on park roads, alternative A would reduce the amount of vegetation trampling and erosion along roadsides and at undesignated parking areas, continuing to have minor long-term, widespread, positive impacts. Alternative B would not dramatically decrease the number of private vehicles on park roads and would have the same impacts as alternative A.

Alternatives A and B for horseback riding and packing services would result in vegetation trampling and erosion due to horse use on trails, having moderate long-term, localized, adverse impacts; however, impacts along Apgar area trails would be less significant under alternative B. Impacts for alternative C would be the same as for alternative A, with the addition of localized impacts from vegetation trampling and erosion in the Two Medicine and St. Mary areas. Alternative D would have the same impacts as alternative A. The removal of the Lake McDonald stables and the use of the area as a trailhead in alternative D would have negligible to minor long-term, site-specific, positive impacts, while potential new development in the Apgar stables area would result in minor long-term, site-specific, adverse impacts. Because alternative D reduces horse-related facilities, there are fewer impacts than in alternatives A and C, but greater impacts than alternative B.

There would be no significant adverse impacts on vegetation resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of vegetation resources as a result of the implementation of any of the alternatives.

Apgar Village Developed Area

- **Alternative A – Status Quo/No Action.** Minimal ground disturbance would occur under this alternative. Most of the disturbance would affect herbaceous and shrub cover types adjacent to Lake McDonald's cobble beach. Vegetation impacted in these riparian areas would include cottonwood, birch, redcedar and spruce trees with an understory dominated by willows, alder and sedges. Exotics already present in the area include knapweed, oxeye daisy and common tansy. This riparian cover is not especially common because it is restricted to lakeshore and streamside

sites. Improvements and repairs that disturb ground or cause trampled vegetation would have negligible to minor short-term, adverse impacts on vegetation resources.

Constructing new accessible trails and walkways, including the hardening or paving of some pathway surfaces, would remove and/or trample some vegetation, resulting in minor adverse impacts. All trails and pathways would cause long-term impacts on vegetation resources while they are maintained; unpaved trails, however, would be easier to reclaim if abandoned. The development of main trails, however, would also have a positive impact on vegetation by discouraging the use of multiple social trails, thereby reducing overall vegetation trampling and erosion throughout the Apgar Village area.

The shoreline stabilization actions would create ground disturbance as well as the potential for spread of exotic plant species, including noxious weeds, and would have negligible adverse impacts.

- **Alternative B (Preferred).** Impacts described under alternative A also apply to this alternative. In addition, alternative B would disturb and remove vegetation over approximately 2.5 acres and restore more than 0.5 acre of vegetation. All impacts would occur within the existing developed area.

Creating a pedestrian green space in Area I along Lake McDonald would restore 0.5 acre of vegetation, resulting in a minor positive impact on vegetation. Revegetating the area with native vegetation would help mitigate vegetation damage and the potential spread of exotic plants, including noxious weeds.

The construction of new parking lots in Areas I and II would result in approximately 2.5 acres of ground disturbance and vegetation removal. Vegetation removed would include trees, woody shrubs and herbaceous ground cover. The majority of new disturbance would be in forest that is currently under successional larch-lodgepole pine cover type, and whose climax cover type is western redcedar-western hemlock. As described in Chapter 3, this cover type has spruce, redcedar, hemlock, white pine, and Douglas fir regenerating in the understory, with mature cottonwood and birch in forest openings. Common understory species include twinflower, prince's pine, queencup beadlily, spiraea, bunchberry dogwood, and thimbleberry. This cover type is common in the Apgar Village area. Some disturbance to stands dominated by large-diameter black cottonwood trees might take place in Area II. In addition, mature trees located near new parking lots would be removed if identified as safety hazards under the park's Hazard Tree Management Plan. Adverse impacts on vegetation from constructing new parking lots would be minor because of the relatively small area of disturbance. New parking would move parked vehicles away from the Apgar Loop roadside; the area along Apgar Loop Road currently used for parking would be reclaimed and planted with native vegetation, resulting in a positive impact on vegetation.

Extending the operating season of the Village Inn eight weeks (three weeks earlier and five weeks later) could effect vegetation by encouraging visitor use of the area earlier in the season when soils are saturated and vegetation is just emerging and vulnerable to trampling. The result could be damage or loss of vegetation, change in species composition and the possible spread of exotic plants. The effects would be negative, minor and long-term.

- **Alternative C.** Alternative C would result in a total of approximately 5.5 acres of ground disturbance and vegetation removal, and 1.75 acres of restoration. All disturbances would occur

within the existing developed area. Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative, with the following exceptions.

Removing the Village Inn and associated parking from Area I and rehabilitating the site to be used as public space would restore over 0.75 acre of ground. The rehabilitation of the area for public use would offset positive impacts from restoration because of vegetation trampling and soil erosion, and because exotic species would likely be used in landscaping. Overall, positive impacts on vegetation would be minor. Constructing new lodging units and parking in Area II to replace the Village Inn would result in approximately 2.5 acres of ground disturbance and vegetation removal. The majority of new disturbance would occur in forest that is currently under successional larch-lodgepole pine cover type and whose climax cover type is western redcedar-western hemlock. This action would have minor adverse impacts on vegetation.

Permanent additional boat ramp parking in Area I would disturb vegetation and cause long-term loss of approximately 0.5 total acre, resulting in minor adverse impacts.

Removing the environmental education cabin from Area II would restore less than 0.5 acre of ground, resulting in a negligible but positive impact. Extending a bicycle path adjacent to Area II to the campground would result in some adverse impacts on vegetation in the immediate area, due to the removal and trampling of vegetation. Impacts would be negligible if the path follows the existing utility corridor and social trail.

- **Conclusion.** Alternative A would have an overall negligible to minor long-term, site-specific, adverse impact on vegetation from ground disturbance.

Alternative B would disturb approximately 2.5 acres of vegetation and restore 0.5 acre, resulting in both positive and negative impacts. Ground disturbance and vegetation removal would result in minor long-term, site-specific, adverse impacts; restoration actions would result in minor long-term, site-specific, positive impacts.

Extending the operating season for both alternatives B and C would have minor negative, long-term impacts. Alternative C would have the greatest overall impact on vegetation. It would cause substantially more ground disturbance and vegetation removal than alternative A or B (approximately 5.5 acres). Adverse impacts under alternative C would be moderate, long-term and site-specific. Although alternative C would restore a greater overall amount of vegetation than would alternatives A or B (approximately 1.75 acres), overall positive impacts under this alternative would also be minor, long-term and site-specific.

There would be no significant adverse impacts on vegetation resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of vegetation resources as a result of the implementation of any of the alternatives.

Lake McDonald Developed Area

- **Alternative A – Status Quo/No Action.** Minimal ground disturbance would occur under this alternative. Improvements and repairs that disturb ground and cause trampled vegetation would have negligible to minor short-term, adverse impacts on vegetation resources.

Constructing new accessible trails and walkways, including hardening or paving of some pathway surfaces, would cause the removal and trampling of some vegetation, resulting in minor adverse impacts. All trails and pathways would cause long-term impacts on vegetation resources while they are maintained; unpaved trails, however, would be easier to reclaim if abandoned. The development of main trails, however, would also have a positive impact on vegetation by discouraging the use of multiple social trails, thereby reducing overall vegetation trampling and erosion throughout the Lake McDonald area.

- **Alternative B.** Impacts described under alternative A also apply to this alternative. In addition, alternative B would involve approximately 3 acres of ground disturbance and vegetation removal, and less than 0.5 acre of restoration. All impacts would occur within the existing developed area.

Constructing new guest and employee parking in Areas II and I would clear approximately 2 acres. The construction of a new parking lot in Area I would require the removal of some large trees from a mature forest stand containing large-diameter western redcedars, black cottonwoods and western larch. All understory vegetation, described in Chapter 3, would also be removed and over time, some old growth trees from the surrounding area would be removed if identified as safety hazards under the park's Hazard Tree Management Plan. This cover type is fairly common for the Lake McDonald area and impacts would be minor. The expansion of parking in Area II would require the removal of mature larch trees and young cedar and western hemlock trees, the removal of herbaceous and shrub vegetation, and the gradual removal of hazard trees. Because the placement of the new parking lots would take advantage of previously disturbed areas and result in a relatively small area of impact, adverse impacts on vegetation would be moderate.

Constructing a new employee housing village in Area II would clear approximately 1 acre of vegetation. A number of trees, including larch, cottonwood, paper birch, and young cedar and hemlock trees, along with understory vegetation would be removed. The area affected would be relatively small and the vegetation cover type in the area is common; therefore, adverse impacts would be minor. Constructing a new public comfort station in Area II would cause minimal ground disturbance and vegetation removal, resulting in minor adverse impacts.

Converting the Garden Court, Cobb House, and Snyder Hall Dormitories to guest accommodations and the Stewart Motel to employee housing would result in vegetation trampling during construction, causing negligible short-term, adverse impacts.

Removing Boys' Dormitories 1 and 2, as well as the Johnson, Jammer and Hydro Dormitories from Area I, and constructing a parking lot, laundry and maintenance facility on part of this site would have negligible positive impacts on vegetation. The construction of a laundry and maintenance facility could require the removal of very large diameter cottonwood and cedar trees. However, tree removal would be minimal, and adverse impacts would be negligible. Removing the existing Coffee Shop parking lot and Girls' Dormitories 1 and 2 from Area II and replacing them with open green spaces would restore less than 0.5 acre. If native vegetation is planted in these open green spaces, impacts would be minor and positive. The use of native vegetation for this revegetation work would be preferable to a lawn cover of exotic grasses.

Extending the operating season of the Lake McDonald Lodge, General Store, Coffee Shop and other visitor accommodations five weeks (two weeks earlier and three weeks longer) would effect vegetation by encouraging visitor use earlier in the season when soils are saturated and vegetation is just emerging and vulnerable to trampling. The result could be damage or loss of vegetation, change in species composition and the possible spread of exotic plants. The effects would be negative, minor and long-term.

- **Alternative C (Preferred).** Alternative C would result in a total of approximately 3 acres of ground disturbance and less than 0.5 acre of restoration. All disturbances would occur within the existing developed area. Applicable impacts described for alternatives A and B would remain the same under this alternative with the following exceptions.

Removing the Coffee Shop and constructing a new restaurant with employee dining and post office in Area II would have negligible adverse impacts from minimal vegetation removal because the new restaurant would be constructed in a previously disturbed area. Constructing a new access road and parking adjacent to the guest cabin units in Area II would result in minimal vegetation removal because there is already an access road and informal parking in the area of the cabin units. Adverse impacts would be negligible.

- **Conclusion.** Alternative A would have an overall negligible to minor long-term, site-specific, adverse impact on vegetation from ground disturbance.

Alternative B would have both positive and negative impacts on vegetation, with greater negative impacts. This alternative would clear just less than 3 acres, which would have an overall minor long-term, site-specific, adverse impact. Extending the operating season for both alternatives B and C would have minor negative, long-term impacts.

Alternative C would have slightly more negative impacts than alternative B. Clearing approximately 3 acres would result in an overall minor long-term, site-specific, adverse impact on vegetation. Alternative C would result in approximately the same amount of revegetated areas as alternative B.

There would be no significant adverse impacts on vegetation resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of vegetation resources as a result of the implementation of any of the alternatives.

Rising Sun Developed Area

- **Alternative A – Status Quo/No Action.** Minimal ground disturbance would occur under this alternative. Improvements and repairs that disturb ground and cause trampled vegetation would have negligible to minor short-term, adverse impacts on vegetation resources.

Constructing new accessible trails and walkways, including hardening or paving of some pathway surfaces, would entail removal and/or trampling of some vegetation. Primarily grassland vegetation type would be impacted, including fescues, brome, bluebunch wheatgrass, junegrass, needle grass and sedges. The grassland vegetation type is fairly common to the area, but is

sensitive to disturbance, particularly to the spread of exotics. Exotics are already quite prevalent in the Rising Sun developed area, including knapweed, oxeye daisy, Canada thistle, houndstongue, and St. John's wort, and the threat of further spread is of concern. Impacts on vegetation would be minor and adverse. All trails and pathways would cause long-term impacts on vegetation resources while they are maintained; unpaved trails, however, would be easier to reclaim if abandoned. The development of main trails would also have a positive impact on vegetation by discouraging the use of multiple social trails, and thereby reducing overall vegetation trampling and erosion throughout the Rising Sun area.

- **Alternative B.** Impacts described under alternative A also apply to this alternative. In addition, alternative B would disturb less than 2 acres of ground. All impacts would occur within the existing developed area.

Stabilizing the bluff where historic guest cabins are located above Rose Creek would disturb and remove some riparian vegetation. Riparian areas support cottonwood, spruce and lodgepole pine trees, with willows, alder and diverse forbs in the understory. This vegetation is not very common in the area, and ground disturbance and vegetation trampling would have minor short-term, adverse impacts on vegetation.

Constructing five new guest cabins with parking and a second employee cabin for the boat concessioner in Area I would remove approximately 2 acres of vegetation, including mature Douglas fir trees, and increase vegetation trampling from visitor recreation activities. The Douglas fir community type is not especially common to the St. Mary Valley; however, in the Rising Sun area, these Douglas fir stands support a diverse understory of shrubs and forbs common to the adjacent grassland vegetation type. The area has been previously developed and adverse impacts on vegetation would be minor to negligible.

Constructing a new employee dormitory with parking and an outdoor recreation facility in Area I would remove less than 1 acre of vegetation with grassland, herbaceous and shrub species, and a few mature Douglas fir trees. Because the area is small and has been partially disturbed by previous development, adverse impacts on vegetation would be minor. The new employee facility would be situated adjacent to sensitive grassland habitat, which is susceptible to the spread of exotic plants, including noxious weeds that are currently present throughout the Rising Sun area. The potential for exotic plant species to spread into a wide area of grassland habitat could have moderate adverse impacts on this sensitive vegetation resource.

Removing the boat concessioner employee housing from Area III would also remove a source of disturbance from sensitive riparian vegetation, causing minor long-term, positive impacts. Moving the ticket booth out of the high water zone would remove vegetation, including aspen trees, alder shrubs, and understory vegetation; however, the amount of removal would be minimal, and adverse impacts would be negligible.

Extending the operating season of the visitor overnight accommodations, Coffee Shop and General Store/Motel/Dormitory five weeks (three weeks earlier and two weeks longer) would encourage visitor use earlier in the spring when soils might be saturated and emerging vegetation more vulnerable to trampling. Five more weeks of occupancy would increase overall effects to vegetation in the vicinity of the developed area. The result could be damage to or loss of vegetation, change in species composition and the possible spread of exotic plants. The effects would be negative, minor and long-term.

- **Alternative C (Preferred).** Alternative C would disturb more than 2 acres. All disturbances would take place within the existing developed area. Impacts described for alternatives A and B, including extending the operating season, would remain the same under this alternative with the following exceptions.

Constructing ten new guest cabins and associated parking in Area I would result in more ground disturbance and vegetation removal (over 1 acre) than would constructing five new cabins under alternative B. However, because the area of disturbance is small and the area has been previously disturbed, minor adverse impacts on vegetation would occur. Vegetation removal would include mature Douglas fir trees as well as shrub and herbaceous understory growth.

Constructing two new employee dormitories and an outdoor recreation facility in Area I would result in more ground disturbance and vegetation removal (over 1 acre) than would constructing one new employee dormitory under alternative B; however, the area of disturbance would still be relatively small, and adverse impacts on vegetation would also be minor. Vegetation removal would involve herbaceous and shrub cover as well as some mature Douglas fir trees. The potential for the spread of exotic plant species into sensitive grassland habitat described under alternative B also applies to this alternative.

Converting the Main Dormitory to visitor accommodations, Power House Dormitory to storage, and the Lower Motel to employee housing would entail vegetation trampling associated with temporary staging and materials storage, causing negligible short-term, adverse impacts.

Modifying the intersection to the campground would cause minimal vegetation removal for new pavement, and would result in negligible adverse impacts on vegetation. Revegetation would have positive impacts and mitigate the spread of exotic species and noxious weeds.

- **Conclusion.** Alternative A would have an overall negligible to minor long-term, site-specific, adverse impact on vegetation from ground disturbance.

Although alternative B would have some positive impacts on vegetation, overall impacts would be minor long-term, site-specific and adverse from ground disturbance, vegetation removal, and the potential spread of exotic species into sensitive grassland habitat. Alternative B would disturb less than 2 acres of ground.

Extending the operating season for both alternatives B and C would have minor negative, long-term impacts. Alternative C would result in only slightly more ground disturbance and vegetation removal than would alternative B, and the total area of impact would be relatively small (approximately 2 acres). Overall impacts on vegetation from alternative C would also be minor, long-term, site-specific, and adverse.

There would be no significant adverse impacts on vegetation resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of vegetation resources as a result of the implementation of any of the alternatives.

Two Medicine Developed Area

- **Alternative A – Status Quo/No Action.** Minimal ground disturbance would occur under this alternative. Improvements and repairs that disturb ground and cause trampled vegetation would have negligible to minor, adverse impacts on vegetation resources.
- **Alternative B (Preferred).** Impacts described under alternative A also apply to this alternative. In addition, alternative B would disturb less than 2 acres of ground and restore as much as 0.5 acre. All impacts would occur within the existing developed area. Most of this disturbance would affect a riparian vegetation type along the Two Medicine Lake shore near the General Store and along Appistoki Creek. These riparian areas support cottonwood, alder, willow, and various forbs, sedges and grasses common to the adjacent grassland vegetation. Riparian areas are fairly common in the Two Medicine developed area, but are already impacted by heavy visitor use.

Constructing new accessible trails and walkways, hardening or paving some pathway surfaces, and constructing a pedestrian bridge over Appistoki Creek would have minor adverse impacts on vegetation due to the removal and trampling of some vegetation. All trails and pathways would cause long-term impacts on vegetation resources while they are maintained; unpaved trails, however, would be easier to reclaim if abandoned. The development of main trails would also discourage the use of multiple social trails, thereby reducing overall vegetation trampling and erosion throughout the Two Medicine developed area and creating a positive impact on vegetation.

Constructing a service road and service/bus parking area for the General Store would disturb less than 1 acre of ground in a site of gravelly soils and sparse black cottonwood trees, shrubs, and herbaceous plant cover adjacent to Appistoki Creek. This area is already somewhat disturbed due to creek channelization and informal service vehicle access. Adverse impacts from some vegetation removal would be negligible to minor. Screening around the service road and parking area with native vegetation would mitigate adverse impacts.

Constructing a new comfort station would disturb less than 0.5 acre of vegetation at the edge of a sensitive grassland community, which includes fescues, brome, bluebunch wheatgrass, junegrass, needle grass and sedges. Grassland vegetation type is not common in the Two Medicine developed area and is particularly sensitive to the spread of exotic plants. Exotic plants already prevalent in the Two Medicine developed area include knapweed, common tansy, Canada thistle, butter-and-eggs and yellow bedstraw. This disturbance would cause minor adverse impacts because of its small area. The increased potential for exotic plant species that are currently present in the Two Medicine area to spread into a relatively pristine and sensitive grassland community could have minor adverse impacts on vegetation.

It is unknown how vegetation would be impacted by restoring historic landscape features in front of the General Store, including the former comfort station site, because landscaping plans have not yet been specified. Impacts would be positive if native vegetation rather than exotic species lawn cover were used for revegetation.

Extending the operating season for the General Store four weeks (one week earlier and three weeks later) would encourage visitor use in areas when soils might still be saturated and emerging plants susceptible to trampling. The result could be damage or loss of vegetation, change in species composition and the possible spread of exotic plants. The effects would be negligible, negative and long-term.

- **Conclusion.** Overall, alternative A would have negligible to minor long-term, site-specific, adverse impacts on vegetation from repairs and improvements.

Alternative B would disturb less than 2 acres of ground, and would have minor long-term, site-specific, adverse impacts on vegetation. Minor long-term, site-specific, positive impacts could occur if restored areas are planted with native species. Extending the operating season would have negligible negative, long-term impacts.

There would be no significant adverse impacts on vegetation resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of vegetation resources as a result of the implementation of any of the alternatives.

Many Glacier Developed Area

- **Alternative A – Status Quo/No Action.** Minimal ground disturbance would occur under this alternative. Improvements and repairs that disturb ground and cause trampled vegetation would have negligible to minor, short-term, adverse impacts on vegetation resources.

Constructing new accessible trails and walkways, including hardening or paving of some pathway surfaces, would have minor adverse impacts on vegetation due to the removal and trampling of some vegetation. All trails and pathways would cause long-term impacts on vegetation resources while they are maintained; unpaved trails, however, would be easier to reclaim if abandoned. The development of main trails would also discourage the use of multiple social trails, thereby reducing overall vegetation trampling and erosion throughout the Many Glacier developed area and resulting in a positive impact on vegetation.

Most disturbance would occur in an open, rocky grassland vegetation type with common grassland species, such as fescues, brome, bluebunch wheatgrass, junegrass, needle grass and sedges. Grassland vegetation type is fairly common in the Many Glacier developed area. Disturbance is likely to cause further spread of exotic plants. Exotics already present in Many Glacier developed area include knapweed, Canada thistle, houndstongue, and butter-and-eggs.

- **Alternative B.** Impacts described under alternative A also apply to this alternative. In addition, alternative B could disturb approximately 1 acre of ground and restore less than 0.5 acre. All impacts would occur within the existing developed area.

Assuming some native species would be used, planting vegetation for screening and landscaping along the approach road and in the area surrounding the hotel would result in minor to negligible, positive impacts on vegetation by restoring native vegetation in the area.

Improving pedestrian access to and around the hotel would reduce the use of multiple social trails, thereby reducing overall vegetation trampling and erosion around the hotel, and resulting in negligible to minor, positive impacts on vegetation. Developing an accessible trail around Swiftcurrent Lake would result in minimal vegetation removal. Because the accessible trail would primarily follow the existing trail, most impacts would be negligible. If new switch-backing is required across steeper sections, there would be new minor long-term impacts on vegetation, including vegetation removal in a mature forest stand of Engelmann spruce and subalpine fir.

The intensity, duration and context of adverse impacts associated with development of an orientation pullout along the Many Glacier Road would depend on final site plans. The area developed for a pullout would be relatively small, and depending on the location and amount of disturbance, adverse impacts on vegetation could range from negligible to minor.

Extending the operating dates of the Many Glacier Hotel and other accommodations two weeks (one week earlier and one week later) would result in encouraging visitor use in areas earlier in the season when soils might still be saturated and emerging plants susceptible to trampling. The result could be damage or loss of vegetation, change in species composition and the possible spread of exotics. The effects would be negative, minor and long-term.

- **Alternative C (Preferred).** Alternative C would disturb approximately 2 acres and restore less than 0.5 acre of ground. All disturbances would occur within the existing developed area. Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative with the following exceptions.

Converting the Lower Dormitory in Area II to visitor accommodations would entail vegetation trampling associated with temporary staging and materials storage, resulting in negligible short-term, adverse impacts.

Constructing a new dormitory and outdoor recreational facility in Area II would disturb ground and remove vegetation in approximately 1 acre. Some of the area has been previously disturbed and used for prior recreational purposes. The area is adjacent to a wetland that supports wetland understory species, primarily alder, willow and sedges. Wetlands are not common in the Many Glacier developed area; however, the placement of the new employee facility would avoid the wetland area. The area of disturbance would also be relatively small, and adverse impacts on vegetation would be minor. Increased employee recreation in the area would also increase vegetation trampling, which would result in additional minor adverse impacts. This area encompasses a transitional site supporting lodgepole pine, subalpine fir, spruce forest, and grassland vegetation types. Disturbance is likely to result in the further spread of exotic plants.

- **Conclusion.** Alternative A would have an overall negligible to minor long-term, site-specific, adverse impact on vegetation from ground disturbance.

Alternative B would have both positive and negative impacts on vegetation from disturbing approximately 1 acre and restoring approximately 0.5 acre of ground. Planting some native vegetation and reducing trampling around the hotel would result in an overall minor long-term, site-specific, positive impact on vegetation. Ground disturbance and some vegetation removal throughout the Many Glacier developed area and at a pullout site along Many Glacier Road would have minor long-term, site-specific, adverse impacts on vegetation. Extending the operating season for both alternatives B and C would have minor negative, long-term impacts.

Alternative C would have the same positive impact on vegetation as alternative B but would have additional adverse impacts. More ground disturbance and vegetation removal on approximately 2 acres would occur under alternative C than under alternatives A or B. However, the total area of disturbance would still be relatively small, and overall adverse impacts from alternative C would be minor, long-term, and site-specific.

There would be no significant adverse impacts on vegetation resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of vegetation resources as a result of the implementation of any of the alternatives.

Swiftcurrent Developed Area

- **Alternative A – Status Quo/No Action.** Minimal ground disturbance would occur under this alternative. Improvements and repairs that disturb ground and cause trampled vegetation would have negligible to minor adverse impacts on vegetation resources.
- **Alternative B (Preferred).** Impacts described under alternative A also apply to this alternative. In addition, alternative B would disturb approximately 4 acres and restore less than 0.5 acre of ground. A little less than half of this new disturbance would occur in forest stands supporting mature lodgepole pine trees plus shrub and herbaceous understories. As described in Chapter 3, these forest stands are dominated by lodgepole pine with some cottonwood, aspen, subalpine fir and spruce. Understory species include beargrass, snowberry, false huckleberry, serviceberry, buffaloberry, willow, honeysuckle, queencup beadlily and arnica. This vegetation is a common forest type. The remainder of the new disturbance would occur in sparse shrub and herbaceous cover types in previously disturbed areas. All impacts would occur within the existing developed area.

Reconfiguring the trail network throughout Areas I, II and III to separate vehicle and pedestrian circulation would cause some vegetation removal and trampling, and would have minor adverse impacts on vegetation. The development of main trails would also discourage the use of multiple social trails, thereby reducing overall vegetation trampling throughout the Swiftcurrent developed area and having a positive impact.

Constructing a fourth motel in Area I would disturb approximately 0.5 acre of ground and remove a minimal amount of vegetation. This alternative would construct three new cabin rings on the former Bath House and Motel 4 site in Area II and approximately five new cabins to complete the existing cabin rings in Area II. The construction would disturb less than 1 acre of new ground and remove a minimal amount of vegetation, and would occur in relatively small areas that have been previously developed. Adverse impacts from this activity on vegetation would be minor to negligible.

Removing parking from the inside cabin rings and providing parking along the loop road in Area II would disturb less than 1 acre and remove a minimal amount of vegetation. Impacts would be minor and adverse.

Realigning the west access road in Area III would disturb approximately 0.5 acre of ground and remove some vegetation. Because the disturbed area is small, adverse impacts on vegetation would be minor. Constructing additional visitor parking and formalizing employee parking adjacent to the Restaurant/Store in Area III would use some previously disturbed areas, including the area occupied by the existing access road. Vegetation removal would be minimal

These forest stands are dominated by lodgepole pine with some cottonwood, aspen, subalpine fir and spruce.

and would result in negligible adverse impacts on vegetation. Creating a new trailhead at the main parking area and a trail to the existing trailhead would remove less than 0.5 acre of vegetation, and impacts on vegetation would be negligible because of the small area and amount of vegetation affected.

Extending the operating dates of the visitor accommodations and Restaurant/Store three weeks (two weeks earlier and one week later) would encourage visitor use in areas when soils might still be saturated and emerging plants susceptible to trampling. The result could be damage or loss of vegetation, change in species composition and the possible spread of exotic plants. The effects would be negative, minor to moderate and long-term.

- **Alternative C.** Alternative C would disturb approximately 5 acres and restore less than 0.5 acre of ground. All disturbances would occur within the existing developed area. Applicable impacts described for alternatives A and B, including extending the operating season, would remain the same under this alternative with the following exceptions.

In Area II, alternative C constructs new employee dormitories, showers, and indoor and outdoor recreation facilities; expands employee parking; constructs a new cabin ring for employee housing; and fills in the existing employee cabin ring with one cabin. These activities would disturb between 1 and 2 acres of ground and remove some vegetation. Placement of the new employee complex would take advantage of previously developed areas, including the former Bath House site, and would have minor adverse impacts on vegetation. This area is also primarily lodgepole pine forest, similar to the vegetation described above.

- **Conclusion.** Overall, alternative A would have negligible to minor long-term, site-specific, adverse impacts on vegetation from repairs and improvements.

Alternative B would clear approximately 4 acres of vegetation and alternative C would clear approximately 5 acres. Both alternatives would use previously disturbed areas for new development and would have overall minor to moderate long-term, site-specific, adverse impacts on vegetation. Extending the operating season for both alternatives B and C would have minor to moderate, negative, long-term impacts.

There would be no significant adverse impacts on vegetation resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of vegetation resources as a result of the implementation of any of the alternatives.

Cumulative Impacts

In areas throughout and adjacent to the park, past actions such as development have affected vegetation resources. Present ongoing services within the park disturb vegetation in developed areas, along roads and trails, and near lakes and rivers. Reasonably foreseeable projects outside the park such as constructing additional employee housing, improving roads and bridges, and U.S. Forest Service timber salvaging would have localized adverse impacts on vegetation. On the other hand, projects such as Forest Service reforestation and noxious and invasive weed management would have positive impacts.

Future development projects inside the park, including the Going-to-the-Sun Road rehabilitation project that could include the removal of vegetation in areas with little or no existing disturbance, would have moderate site-specific, adverse impacts on vegetation. In addition, projects within or near the park that involve ground disturbance, as well as transportation and recreation, would contribute to the spread of invasive species on a regional scale. The combined impacts of all actions both inside and outside the park, and any of the alternatives would have an overall minor, regional, long-term, adverse cumulative impact on vegetation.

WILDLIFE, INCLUDING AQUATIC SPECIES

Methodology

Current conditions of wildlife in general were assessed through informal consultation with the U.S. Fish and Wildlife Service, and wildlife biologists from Glacier National Park and from outside the Park Service. Alternatives were evaluated on the basis of data and other information gathered from the following sources: Glacier National Park inventory, monitoring and sighting databases, as well as research information from U.S. Geological Survey scientists, universities, and independent researchers; geographic information systems (GIS) themes (provided by the park's GIS specialist); interviews with terrestrial and aquatic wildlife experts; Glacier National Park monitoring reports; and current literature.

Knowledge of ecological relationships and processes on the landscape and regional scale is well established, but knowledge of the status of wildlife populations and local conditions at the site-specific level is largely incomplete or unavailable for many areas in the park. In light of these knowledge gaps, this analysis describes impacts on wildlife in terms of changes to habitat quality, quantity and distribution, such as habitat loss or gain, degradation or enhancement, fragmentation or connectivity, amount of human disturbance, and potential for increased or decreased conditioning of wildlife.

The response of wildlife to human presence is complex, and different species of wildlife have different tolerances for interaction with humans. Tolerance levels for interaction also vary by time of year, reproductive status, age, habitat type, food availability, topography and degree of habituation. This analysis assesses potential impacts from construction and operation by season. The seasons analyzed are:

- Spring (15 March – 15 June)
- Summer (15 June – 15 September)
- Fall (15 September – 15 November)
- Winter (15 November – 15 March)



In this discussion, construction includes major repair and/or rehabilitation, demolition, deconstruction, rehabilitation, maintenance, etc. The type of construction activity (i.e., heavy or light, interior or exterior, major or minor) and the scheduling of the work (both time of day and season) are factors that influence the duration, intensity and context of the associated impacts. Any extended or increased concessioner services will also influence the duration, intensity and context of associated impacts.

Thresholds of impact are defined in Table 4.1.

- *Negligible*: 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.
- *Minor*: Effects on wildlife would be detectable, although the effects would be localized, and would be small and of little consequence to the species' population.
- *Moderate*: Effects on wildlife would be readily detectable and widespread, with consequences at the population level.
- *Major*: Effects on wildlife would be obvious and would have substantial consequences to wildlife populations in the region.
- *Short-term*: After implementation, would recover in less than 1 year.
- *Long-term*: After implementation, would take more than 1 year to recover or effects would be permanent.

Impacts Common to All Alternatives

Construction activities would result in short-term impacts on wildlife due to increased levels of noise, human activity, erosion, dust, artificial lighting, vegetation trampling, vegetation removal, spread of exotic species, wildlife attractants and environmental pollutants. Mitigation measures would be implemented during construction under all alternatives to minimize these impacts.

Construction activities and added concessioner services during the summer would have fewer adverse effects on wildlife. Existing development, including concessioner services, and a past history of human disturbance in these areas have already affected habitat quality in summer. Adverse effects would be more likely during spring, fall and winter when wildlife are accustomed to decreased visitor use. Many species of wildlife are more vulnerable to the effects of human-induced stress in spring, fall and winter when energy expenditure is greatest and food resources are less abundant. Sustained (year after year) construction activities during late fall, early spring and winter in the Rising Sun, Two Medicine, Many Glacier and Swiftcurrent developed areas would have greater consequences for wildlife because roads into these areas have not historically been maintained for motorized access in winter. Year-round construction at these four sites would require that seasonally closed roads be kept open throughout the winter. Increased human presence and activity at these sites in winter would result in a moderate to major impact on wildlife because of the greater likelihood of human-induced stress, displacement, harassment and habituation.

Expanding the season for construction in the Apgar Village and Lake McDonald developed areas from current dates would increase the level of human disturbance to wildlife during the sensitive spring and fall seasons, resulting in a moderate long-term, adverse impact. The proposed actions would create the following long-term adverse impacts on special status wildlife species and habitat: loss of riparian woodland and upland forest habitats, noise and light disturbance from new facilities, creation of new areas for brown-headed cowbirds, increased human disturbance in adjacent habitats, increased trampling of vegetation, increased chance of wildlife conditioning to human food, disturbance from traffic and people, increased need for hazard tree management, reducing snag habitat, and increased chance of human/wildlife conflicts.

Formalizing pedestrian pathways would have negligible, localized impacts on aquatic special status species. Sedimentation from ground disturbance would cause short-term adverse impacts, and sediments and pollutants associated with increased water run-off would cause long-term adverse impacts. Pollutants associated with increased water run-off from the sidewalks situated immediately adjacent to the waterways would create long-term adverse impacts. Formalizing and hardening pedestrian pathways along the waterways would reduce the amount of soil and vegetation available to filter sediments and pollutants in run-off from the surrounding developed areas. This could alter natural erosion processes around and in the waterways, and in some cases downstream, thereby resulting in additional adverse impacts on wildlife.

Impacts from other activities on wildlife and wildlife habitat generally would be characterized as long-term. Long-term impacts are associated with the new development in previously developed areas and operation of facilities and services or with actions resulting in the permanent modification or loss of habitat. The long-term impacts of new development on wildlife would include: habitat loss (such as plant communities, snags, down logs, etc.), habitat fragmentation and loss of connectivity, habitat modification (such as floodplain, streambank, and lakeshore stabilization), and adverse edge effects. These impacts also would entail displacement and avoidance behavior, vulnerability to poaching and illegal collection, increased potential for chronic negative interactions with humans, direct mortality from vehicles, harassment and disturbance, and disruption of wildlife movement (e.g., dispersal and migration). The introduction and spread of non-native species and degradation of rare and unique communities (such as those found in talus slopes, cliffs, caves, meadows, riparian areas and wetlands) could occur. There would also be increased levels of human-induced physiological stress, lowered success in reproduction and rearing of young, and loss of habitat complexity. Site-specific and species-specific long-term impacts are described in more detail for each alternative. Removing debris at low water from Snyder Creek in the vicinity of the bridges within the developed area would have minor adverse, short-term impacts on aquatic species.

Impact Analysis For Necessary and Appropriate Services Alternatives

Granite Park Chalet

- **Alternative A – Status Quo/No Action.** Operation of the chalet as a hiker shelter and concentration of visitor activity would have no additional effect on wildlife. Wildlife would continue to be disturbed by human activity in the area. The chalet sits at the subalpine to alpine transition zone, and the area is interspersed with high value wildlife habitats. Human/wildlife conflicts would persist because food storage and sanitation that attract wildlife would continue to be available in the area. The use of helicopters for removing waste would continue to disturb wildlife and cause minor adverse effects.
- **Alternative B (Preferred).** The very few ground disturbing activities that are proposed under this alternative would occur in a relatively small area that has been previously disturbed by human activities. As a result of the currently disturbed nature of the site and existing adjacent development, long-term adverse impacts would be negligible. Moderate short-term, adverse impacts would occur during construction due to numerous helicopter flights and the additional pack trips needed to transport construction materials. Under this alternative, removing sanitary waste by helicopter would cease, resulting in minor long-term, positive impacts on wildlife.
- **Alternative C** would have the same impacts as alternative B. However, the area disturbed by development would increase slightly under this alternative. Maintenance and operation of a full-

service dining and overnight facility would increase human use and therefore increase the levels of human disturbance to wildlife, resulting in minor long-term, adverse impacts on wildlife.

Guided Day Hiking (Cultural/Natural/Recreational)

- **Alternative A – Status Quo/No Action.** Although trained guides offer some enhancement to visitor awareness of sensitive resources and leave-no-trace backcountry travel techniques, the lack of limits to group size or number of trips per day under alternative A exacerbates wildlife disturbances. This alternative poses minor adverse impacts on wildlife resources due to continued disturbance and displacement of wildlife.
- **Alternative B (Preferred)** would limit group size for guided day hikes and the number of trips per day on high-traffic trails; however, it would also have a minor adverse impact on wildlife due to continual disturbance and displacement of wildlife.

Guided Underwater Diving Tours

- **Alternative A – Status Quo/No Action** would have no impact on wildlife because guided underwater diving tours would not occur in the park.
- **Alternative B (Preferred)** would cause minor adverse impacts on wildlife and aquatic species in and around Lakes McDonald, Sherburne and Josephine, as well as Swiftcurrent, Two Medicine, Pray, Lower Two Medicine, and St. Mary Lakes due to trampling of vegetation in aquatic habitats, increased levels of noise in remote habitats, and increased human disturbance in adjacent habitats. Additional causes would be the introduction of non-native plant and animal species, increased turbidity, sanitary waste disposal problems, the deposition of oil/gas mixtures on the water surface, and the increased chance of human/wildlife conflicts.

Firewood Sales

- **Alternative A – Status Quo/No Action** would continue firewood sales in camp stores, reducing the extent of wood gathering around campgrounds, and thereby reducing wildlife disturbances along social trails surrounding campgrounds. This operation would have a negligible beneficial impact on wildlife.
- **Alternative B (Preferred).** Although expanding firewood sales operations at developed campgrounds under this alternative might entail new short-term wildlife disturbance during construction, it would also reduce the impacts associated with visitors gathering wood from around the campgrounds, resulting in negligible long-term, beneficial impacts on wildlife.

Boat Tours and Transportation (Boat Taxi)

- **Alternative A – Status Quo/No Action.** The use of large, motorized boats directly affects wildlife by displacing individuals from high-value riparian and aquatic habitats into marginal habitats where forage quality and habitat security might be lower. Wave action from boats can disturb aquatic vegetation and smaller animals that nest or live there. Indirect impacts on water quality and other habitat components also affect wildlife. Boats contribute to increased turbidity, sanitary waste disposal problems, and the deposition of oil/gas mixtures on the water surface. Continued boat tour and transportation services would continue to have minor adverse impacts on wildlife.

- **Alternative B (Preferred).** Impacts under this alternative would not dramatically increase in the Lower McDonald Creek drainage due to added tour boat services on Lake McDonald. Impacts would be minor and adverse.

Horseback Riding and Horse Packing Services

- **Alternative A – Status Quo/No Action (Preferred).** Horseback riding and horse packing services would continue to cause minor to moderate adverse impacts on wildlife due to trampling of habitat along trails, noise in remote habitats, and human disturbance in adjacent habitats. Additional impacts occur from are influx of nutrients from livestock droppings and urine, wildlife conditioning to human and livestock food, spread of non-native plant species affecting wildlife habitat, human/wildlife conflicts and spread of disease.
- **Alternative B** would have the same impacts as alternative A, but would result in a reduction of impacts associated with guided horseback riding on trails originating from the Apgar stables.
- **Alternative C** would have the same impacts as alternative A, with an increase in impacts in the Two Medicine and St. Mary areas due to added horseback riding services.
- **Alternative D** would have the same impacts as alternative A, but would result in a reduction of impacts for guided horseback riding and horse packing in the Lake McDonald area.

Conclusion

Alternative A for Granite Park Chalet would continue to have minor long-term, site-specific, adverse impacts on wildlife. Alternative B would have negligible long-term, site-specific, impacts from wildlife disturbance and displacement, while alternative C would have minor long-term, site-specific impacts. In addition, alternatives B and C would cause minor long-term, site-specific, positive impacts because hauling of sanitary waste by helicopter would cease.

Alternative B for guided day hiking would have a less negative impact on wildlife than alternative A because it limits group sizes and the number of trips per day on high-traffic trails. Although both alternatives would have minor long-term, localized, adverse impacts on wildlife from human disturbances, alternative B's impacts would be less due to the limited number of visitors at any given time.

Under alternative A, guided underwater diving tours would not be available in the park; therefore, there would be no impact on park wildlife. Alternative B would have minor long-term, localized, adverse impacts on wildlife.

Alternatives A and B for firewood sales would result in overall negligible long-term, site-specific, positive impacts on wildlife near campgrounds by reducing disturbances from visitors gathering wood.

Alternatives A and B for boat tours and transportation (boat taxi) would have minor long-term, localized, adverse impacts from wildlife disturbance.

Alternatives A, B and D for horseback riding and packing services would have overall minor to moderate, long-term, localized, adverse impacts. Impacts for alternative C would be the same as for alternative A, with the addition of localized impacts in the Two Medicine and St. Mary areas.

There would be no significant adverse impacts on wildlife whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of wildlife as a result of the implementation of any of the alternatives.

Apgar Village Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would have minor short-term, adverse impacts on wildlife during construction due to noise and movement.

If implemented during the current maintenance and operating season, this alternative would have no new effect on wildlife.

- **Alternative B (Preferred).** Impacts described for Alternative A would remain the same under this alternative.

This alternative involves approximately 2.5 acres of new disturbance and would restore over 0.5 acre.

Plans to improve pedestrian pathways and roadways in the developed area and to renovate the Village Inn would affect a relatively small area previously disturbed by human activities. Converting a social trail and utility corridor to a new bike path between Apgar Village and the campground would result in a negligible impact, since the area is already disturbed. This social trail already appears to receive regular use by visitors traveling to and from the campground in summer. The impacts of trail construction would be short-term and negligible to minor, depending on the season. If construction occurred in the summer, impacts would be negligible. If construction occurred during the spring, fall or winter, impacts would be short-term and have greater adverse effects because these are sensitive seasons for most wildlife in Glacier National Park, and the trail runs through habitat occupied by wildlife. Constructing new parking lots in the Apgar area would adversely affect about 2.5 acres of undeveloped land and result in a long-term adverse impact. Construction of the parking lots and other visitor-related items in the summer would have short-term and less adverse impacts. Construction in the spring, fall and winter would have moderately adverse impacts on wildlife.

Extending the operating season of the Village Inn eight weeks (three weeks earlier and five weeks later) could affect wildlife by encouraging more visitor use in the early and late season at Apgar. Early in the year, nesting birds could be affected and the total time extension could affect migrating aquatic avian species that use the foot of Lake McDonald. Other species could be displaced within and adjacent to the developed area during the sensitive spring and fall seasons. Increased activity during the spring and fall could affect energy expenditure and productivity, and increase mortality. Overnight users might also impact other nearby areas since the duration and time of their stay would be different than for day users. The effects would be negative, minor and long-term.

- **Alternative C.** Impacts described for alternatives A and B, including extending the operating season, would remain the same under this alternative with the following exceptions.

Removing the Village Inn and constructing a public space at this site adjacent to the Lake McDonald outlet would result in minor to moderate long-term, adverse impacts on wildlife. Although the continued use of the area by residents from the Inn would be eliminated, visitor use at the lake outlet would likely increase the amount of human disturbance to important wildlife habitat.

The construction of the new parking lots and new visitor lodging would result in a greater likelihood of measurable but minor losses of habitat quality and quantity at Apgar relative to alternatives A and B. Consequently, moderate long-term, adverse effects on wildlife would be expected to occur as a result of the proposed actions in the Apgar Village developed area.

Proposed construction activities would result in minor short-term impacts in summer, and moderate short-term impacts in spring, fall and winter.

- **Conclusion.** Alternative A would have minor short-term, localized adverse impacts on wildlife during construction. Under alternative B, the construction of new parking lots would result in a greater likelihood of measurable but minor losses of habitat quality and quantity in the Apgar Village developed area than would alternative A. Consequently, minor long-term, adverse impacts on wildlife would result from the proposed actions in the Apgar Village developed area. The construction of the new parking lots and new visitor lodging under alternative C would result in a greater likelihood of measurable losses of habitat quality and quantity in the Apgar Village developed area relative to alternatives A and B. Consequently, moderate long-term, adverse impacts on wildlife would result from the proposed actions. Extending the operating season for both alternatives B and C would have minor negative, long-term impacts.

There would be no significant adverse impacts on wildlife whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of wildlife as a result of the implementation of any of the alternatives.

Lake McDonald Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would have minor short-term, adverse impacts during implementation. If implemented during the current maintenance and operating season, this alternative would have no new effect on wildlife.
- **Alternative B.** Impacts described under alternative A also apply to this alternative.

Removing several structures (Boys' Dormitories 1 and 2, and Johnson, Jammer and Hydro Dormitories from Area I, as well as the existing Coffee Shop parking lot and Girls' Dormitories 1 and 2 from Area II) and revegetating would have a negligible impact on wildlife, given the small area restored and the proximity of adjacent development. Removal of these facilities might slightly reduce the need to remove hazard trees from within the Snyder Creek floodplain. This alternative would result in a slight decrease in the number of guests and/or employees at this site.

The new employee housing area proposed near the Coffee Shop would result in expanded human presence in the adjacent forested habitat; however, human presence and adjacent development have previously disturbed this area. Short-term impacts associated with construction would also be moderate during all seasons. Parking lot and road improvement projects north of Snyder Creek would have minor to moderate, long-term impacts due to loss of habitat. Impacts from construction would be minor and short-term if construction occurs in summer. If construction were scheduled during spring, fall or winter, impacts would be of minor to moderate and short-term because these are sensitive seasons for most wildlife in Glacier. Construction of new facilities south of Snyder Creek would result in the removal of an important vegetation type (western redcedar and black cottonwood mature forest); this action would result in moderate long-term, adverse impacts. Construction activities would cause short-term adverse impacts, which would be negligible to minor if work were scheduled in summer, and minor to moderate in spring/fall/winter (depending on the proximity of the project site to sensitive habitats). Construction planned for buildings located immediately adjacent to Snyder Creek or Lake McDonald would have a greater potential to impact wildlife than would construction in areas nearer to the Going-to-the-Sun Road.

Extending the operating season of the Lake McDonald Lodge, General Store, Coffee Shop and other visitor accommodations five weeks (two weeks earlier and three weeks longer) would displace wildlife from habitat within and adjacent to the developed area during sensitive spring and fall seasons. Increased activity during this time could affect energy expenditure and productivity, and increase mortality. Overnight visitors might also impact other nearby areas since the duration and time of their stay would be different than for day users. The effects would be negative, minor and long-term.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative with the following exceptions.

Constructing a new access road and parking adjacent to the guest cabin units in Area II would increase the loss of wildlife habitat and the amount of wildlife disturbances in the area, having an overall minor long-term, localized, adverse impact.

- **Conclusion.** Overall, alternative A would have a minor long-term, localized, adverse impact on wildlife and wildlife habitat from developing paths. Although alternative C would result in a greater amount of new development and some increase in loss of habitat, both alternatives B and C would have overall minor to moderate, localized, long-term, adverse impacts on wildlife. Extending the operating season for both alternatives B and C would have minor negative, long-term impacts.

There would be no significant adverse impacts on wildlife whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of wildlife as a result of the implementation of any of the alternatives.

The St. Mary Valley is winter range for elk and other ungulates.

Rising Sun Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would have minor short-term, adverse impacts during implementation. If implemented during the current maintenance and operating season, this alternative would have no new effect on wildlife.
- **Alternative B.** Impacts described under alternative A also apply to this alternative.

Removal of boat concession housing from the St. Mary Lake shoreline would result in the restoration of some lakeshore habitat, resulting in a negligible long-term, positive impact on wildlife.

Stabilizing the bluff where historic guest cabins are located above Rose Creek would cause minor short-term, adverse impacts on wildlife due to construction. Constructing five new cabins with parking in Area I, as well as a new employee dormitory with parking and an outdoor recreation facility, would result in some increased loss in wildlife habitat; thus, the impacts would be minor to moderate and long-term.

The short-term impacts of construction would be minor to moderate, depending on the construction schedule. Winter work would require the park to plow the Going-to-the-Sun Road so that construction crews could access the site at a time of year when this segment of the road is normally closed. The St. Mary Valley is winter range for elk and other ungulates. Increased human disturbance of wintering wildlife could result in displacement, greater energy expenditure, decreased productivity, and increased mortality. These impacts on ungulate populations would likewise impact carnivores that rely on these prey species (mountain lions, gray wolves, coyotes, grizzly bears, black bears, and wolverine). Maintenance of the road in winter would also increase the potential for poaching and illegal collection of wildlife.

Extending the operating season of the visitor overnight accommodations, Coffee Shop and General Store/Motel/Dormitory five weeks (three weeks earlier and two weeks longer) would displace wildlife species from habitat within and adjacent to the developed area during the sensitive spring and fall seasons. Increased activity during the spring and fall could affect energy expenditure and productivity, and increase mortality. Overnight visitors may also impact other nearby areas since the duration and time of their stay would be different than for day users. The effects would be negative, minor and long-term.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative with the following exceptions.

Constructing ten new cabins and associated parking, and two new employee dormitories including an outdoor recreation facility in Area I would result in loss of wildlife habitat, creating minor to moderate adverse impacts.

- **Conclusion.** Overall, alternative A would have a minor short-term, localized, adverse impact on wildlife. Overall impacts for alternative B would be minor to moderate long-term, localized, and adverse from construction and development. Extending the operating season for both alternatives

B and C would have minor negative, long-term impacts. Although alternative C would result in more development than would alternative B, overall adverse impacts from development under this alternative would also be minor to moderate long-term, and localized. There would be more habitat loss under alternative C than under alternative B.

There would be no significant adverse impacts on wildlife whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of wildlife as a result of the implementation of any of the alternatives.

Two Medicine Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would result in minor to negligible short-term, adverse impacts during implementation.
- **Alternative B.** Impacts described under alternative A also apply to this alternative. Under this alternative, several small ground-disturbing activities are proposed that would occur mainly in areas previously disturbed by human activities. As a result of the currently disturbed nature of the sites and existing adjacent development, long-term adverse impacts would be negligible to minor. Short-term adverse impacts associated with maintenance, repairs and construction would be negligible if work occurs in summer. If construction is scheduled during spring or fall, short-term impacts would be of moderate intensity (construction would not occur in winter at this site). Work scheduled in late fall or early spring would require the park to plow the Two Medicine Road so that construction crews could access the site at a time of year when this road is often closed. The Two Medicine Valley contains year-round range for bighorn sheep and other ungulates. Increased human-caused disturbance to wildlife in early spring could result in displacement, greater energy expenditure, decreased productivity, and increased mortality. Impacts on ungulate populations would likewise impact carnivores that rely on these prey species (mountain lions, gray wolves, coyotes, grizzly bears, black bears, and wolverine). Maintenance of the road in these seasons would also increase the potential for poaching and illegal collection of wildlife.

Extending the operating season for the General Store four weeks (one week earlier and three weeks later) might displace some wildlife species adjacent to the store, but the effects would be negligible, negative and long-term.

- **Conclusion.** Overall, alternative A would have minor short-term, localized, adverse impacts on wildlife from repairs and improvements, and alternative B would have an overall minor long-term, localized, adverse impact on wildlife due to wildlife disturbance and displacement. Extending the operating season in alternative B would have negligible negative, long-term impacts.

There would be no significant adverse impacts on wildlife whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of wildlife as a result of the implementation of any of the alternatives.

Many Glacier Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would have minor to negligible short-term, adverse impacts during implementation.
- **Alternative B.** Impacts described under alternative A also apply to this alternative.

Very few ground-disturbing activities are proposed under this alternative, and those described would occur in a relatively small area previously disturbed by human activities. As a result of the currently disturbed nature of the site and adjacent development, long-term adverse impacts would be negligible. Plans to improve employee outdoor recreation opportunities would have minor to moderate long-term, adverse impacts depending on the size and location of the project site. Short-term adverse impacts would occur because of construction activities. Short-term adverse impacts associated with construction for all proposed actions would likely be negligible if work occurs in summer. If construction is scheduled during spring, fall, or winter, short-term impacts would be of minor to moderate intensity in spring/fall and moderate to major intensity in winter. Winter work could require the park to plow the Many Glacier Road so that construction crews could access the site at a time of year when this road is normally closed. The Many Glacier Valley contains year-round range for bighorn sheep and other ungulates. Increased human-caused disturbance to wildlife in early spring could result in displacement, greater energy expenditure, decreased productivity, and increased mortality. Impacts on ungulate populations would likewise impact carnivores that rely on these prey species (mountain lions, gray wolves, coyotes, grizzly bears, black bears, and wolverine). Maintenance of the road in these seasons would also increase the likelihood of poaching and illegal collection of wildlife.

Extending the operating dates of the Many Glacier Hotel and other accommodations two weeks (one week earlier and one week later) would affect wildlife by displacing species from habitat within and adjacent to the developed area during the sensitive spring and fall seasons. To open the hotel and related facilities, the staff is usually present in the valley five to six weeks prior to opening. Increased activity in the spring and fall could affect energy expenditure and productivity, and increase mortality. Overnight visitors might also affect wildlife in nearby areas since the duration and time of their stay would be different than for day users. The effects would be more pronounced because the operating seasons for both the Many Glacier and Swiftcurrent facilities would be extended, since they are in the same valley. The effects would be negative, minor and long-term.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative with the following exceptions.

Constructing a new dormitory and outdoor recreational facility in Area II would result in a moderate, long-term adverse impact on wildlife and wildlife habitat because they would be constructed within an important wildlife corridor.

- **Conclusion.** Overall, alternative A would have a minor long-term, localized, adverse impact on wildlife from disturbance and temporary displacement. Alternative B would result in an overall minor, long-term, localized, adverse impact. Extending the operating season for both alternatives B and C would have minor negative, long-term impacts. Alternative C would have the greatest

overall adverse impact, with disturbances and loss of wildlife habitat resulting in impacts that would be minor to moderate long-term, and localized.

There would be no significant adverse impacts on wildlife whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of wildlife as a result of the implementation of any of the alternatives.

Swiftcurrent Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would have minor short-term, adverse impacts on wildlife during implementation.
- **Alternative B (Preferred).** Impacts described under alternative A also apply to this alternative.

Obliterating a short segment of paved road would result in the eventual restoration of a small amount of forested habitat. This would have a negligible long-term impact on wildlife, given the small area affected and the proximity of adjacent development.

Constructing new guest cabins and a new motel would have minor to moderate long-term, adverse impacts on wildlife because some forested habitat would be removed. Constructing new parking lots would likewise result in a minor loss of forested habitat. Most of the other proposed ground-disturbing activities would occur in a relatively small area that has been previously disturbed by human activities. As a result of the currently disturbed nature of the site and existing adjacent development, long-term impacts would be negligible. Short-term impacts would occur because of construction activities. For all proposed actions, these impacts would likely be negligible to minor if work occurs in summer. If construction is scheduled during spring, fall, or winter, short-term impacts would be of moderate intensity in spring/fall and moderate to major intensity in winter. Winter work would require the park to plow the Many Glacier Road so that construction crews could access the site at a time of year when this road is normally closed. The Many Glacier Valley contains year-round range for bighorn sheep and other ungulates. Increased human-caused disturbance to wildlife in early spring could result in displacement, greater energy expenditure, decreased productivity, and increased mortality. Impacts on ungulate populations would likewise impact carnivores that rely on these prey species (mountain lions, gray wolves, coyotes, grizzly bears, black bears, and wolverine). Maintaining access into these areas during these seasons would also increase the likelihood of poaching and illegal collection of wildlife.

Extending the operating dates of the visitor accommodations and Restaurant/Store three weeks (two weeks earlier and one week later) would displace wildlife species from habitat within and adjacent to the developed area during the sensitive spring and fall seasons. To open the motel and related facilities, the staff is usually present in the valley 5-6 weeks prior to opening. Increased activity during this time could affect energy expenditure and productivity, and increase mortality. Overnight visitors might affect wildlife in other nearby areas since the duration and time of their stay would be different than for day users. The effects would be more pronounced by extending operation dates of both the Many Glacier and Swiftcurrent facilities, since they are in the same valley. The effects would be negative, minor and long-term.

- **Alternative C.** Impacts for this alternative would be the same as described under alternative B.
- **Conclusion.** Overall, alternative A would have minor to negligible short-term, localized, adverse impacts on wildlife from repairs and improvements. Alternatives B and C would result in roughly the same amount of impact on wildlife. Both alternatives would have an overall minor to moderate long-term, localized, adverse impact on wildlife habitat due to habitat loss and wildlife displacement. Extending the operating season for both alternatives B and C would have minor negative, long-term impacts.

There would be no significant adverse impacts on wildlife whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of wildlife as a result of the implementation of any of the alternatives.

Cumulative Impacts

During the history of Glacier National Park, development to accommodate visitors and steady growth in park visitation have affected wildlife through loss of habitat and disturbance from increased human presence. Impacts on wildlife extend beyond physical boundaries because some species are less likely to use habitats near heavily used areas such as roads, trails, campgrounds and other developments.

In areas throughout and adjacent to the park, past actions such as development have affected wildlife. Present ongoing services within the park disturb wildlife habitat in developed areas, along roads and trails, and near lakes and rivers, contributing to habitat displacement. Reasonably foreseeable projects outside the park such as constructing additional employee housing, improving roads and bridges, and U.S. Forest Service timber salvaging and trail construction would have localized adverse impacts. Future development projects inside the park, including the Going-to-the-Sun Road rehabilitation project that could include the loss of habitat in areas with little or no existing disturbance, would have moderate site-specific, adverse impacts. The combined impact of all actions both inside and outside the park, and any of the alternatives would have an overall minor to moderate long-term, regional, adverse cumulative impact on wildlife.

THREATENED AND ENDANGERED / STATE LISTED SENSITIVE SPECIES



USNPS Photo

Wildlife

Methodology

Methodology for threatened and endangered species, and state listed sensitive species was consistent with the methodology described previously for wildlife, including aquatic species.

Thresholds of impact are defined in Table 4.1.

- *Negligible:* 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.

- *Minor*: 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 affect" 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.
- *Moderate*: An individual or population of a listed species, or its critical habitat would be noticeably affected. The effect could have some long-term consequence to individuals, population, or habitat. Moderate effect would equate with a "may affect" 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.
- *Major*: 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 affect" 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*: After implementation, would recover in less than 1 year.
- *Long-term*: After implementation, would take more than 1 year to recover or effects would be permanent.

Impacts Common to All Alternatives

Removing debris from Snyder Creek would have minor adverse, short-term impacts on bull trout from potential sediment. Removal would be done at low water and by cutting debris rather than by digging it out to reduce the potential for sediment releases.

Impact Analysis For Necessary and Appropriate Services Alternatives

Granite Park Chalet

- **Alternative A – Status Quo/No Action** would have no additional impacts on threatened and endangered wildlife.

This alternative would not alter habitat or change human-use patterns in or near areas that likely would be occupied by the following species.

- Bald Eagle. Since adherence to helicopter flight guidelines would ensure that helicopter flights maintain a minimum distance from active eagle nests in order to mitigate disturbance to bald eagles and their young, this alternative would have no additional effect on the bald eagle.
- Grizzly Bear. No measurable change to existing habitats would occur.
- Gray Wolf. Disturbance associated with ongoing maintenance activities is not expected to influence ungulate population trends in distribution. Therefore, no additional impacts to the gray wolf are expected.
- Canada Lynx. Neither alteration of vegetation within the developed area, nor changes in human activity patterns associated with construction and maintenance are expected to

influence prey species population trends in distribution, human access levels, or the range of lynx competitors and/or predators.

- Bull Trout. Although fuel or cargo spills in Upper McDonald Creek from the helicopter could have adverse effects on habitat, with mitigation, there should be no effect.

No additional effects would occur to state listed sensitive species since the operation would not change.

- **Alternative B (Preferred)**. Noise of numerous helicopter flights and human activities associated with pack trips needed to transport construction materials could cause minor to moderate short-term, adverse impacts to the bald eagle and grizzly bear, and possibly the gray wolf and Canada lynx during construction. Under this alternative, the practice of removing sanitary waste by helicopter would cease, resulting in minor long-term, positive impacts due to elimination of helicopter noise and potential human interference.

- Bald Eagle. Following helicopter flight guidelines would ensure that the flights would maintain a minimum distance from active eagle nests in order to mitigate disturbance to bald eagles and their young. Increased helicopter traffic would result in a minor negative impact on the bald eagle.
- Grizzly Bear. Additional disturbance of forest and meadow habitats would result in the minor loss of grizzly bear habitat. The overall impact on grizzly bears from flights and construction activity would be moderate, short-term and negative.
- Gray Wolf. Gray wolves are rarely sighted in the vicinity of the Granite Park Chalet. This alternative would alter habitats and human use patterns in or near areas that could potentially serve as den or rendezvous sites in the future and would have minor, negative effects on gray wolves during construction.
- Canada Lynx. This alternative would alter habitats and human use patterns in or near suitable denning habitat. Alteration of vegetation within the developed area, and changes in human activity patterns associated with construction and maintenance might be expected to influence prey species population trends in distribution, human access levels, or the range of Canada lynx competitors and/or predators. Overall, the impact to lynx could be moderate, short-term and negative.
- Bull Trout. Although fuel or cargo spills in Upper McDonald Creek from the helicopter could have adverse effects on habitat, with mitigation, there should be no effect.

Construction work and related helicopter flights could have moderate to major, short-term, adverse impacts on wolverine and golden eagles, and displace or disturb numerous sensitive bird species.

- **Alternative C** would have the same impacts as alternative B. The area disturbed by development would also increase slightly under this alternative, and maintenance and operation of a full-service dining and overnight facility, more support and horse trips, flights and construction could result in increased levels of human disturbance to the bald eagle, grizzly bear, gray wolf, and Canada lynx. There would be no effect on bull trout.

Construction work and related helicopter flights could have moderate to major, short-term, adverse impacts on wolverine and golden eagles, and displace or disturb numerous sensitive bird species. The effects would be greater for alternative C than B because of more disturbance and the need for more frequent support trips for the chalet.

Guided Day Hiking (Cultural/Natural/Recreational)

- **Alternative A – Status Quo/No Action.** Day hiking directly affects wildlife by displacing it from high value habitats into marginal habitats where security and forage quality might be lower. Although trained guides would enhance visitor awareness of sensitive resources and leave-no-trace backcountry travel techniques, the lack of limits to group size or number of trips per day would exacerbate wildlife disturbances. The threatened and endangered species below and their habitat use would continue to be affected by the presence of day hikers in remote habitats throughout the park. These conditions would result in minor adverse impacts due to disturbance and displacement. However, no measurable changes to existing habitats would occur.
 - Bald Eagle. Existing conditions would continue to degrade gradually as a result of continued concentrated and radiating human use.
 - Grizzly Bear. This alternative would not change human-use patterns in or near areas that would likely be occupied by grizzly bears. Existing conditions would continue to degrade gradually as a result of continued concentrated and radiating human use.
 - Gray Wolf. This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den or rendezvous sites in the future. Existing conditions would continue to degrade gradually as a result of continued concentrated and radiating human use.
 - Canada Lynx. This alternative would not result in the alteration of vegetation, or changes in human activity that could influence prey species population trends in distribution, human access levels, or the range of lynx competitors and/or predators.
 - Bull Trout. There would be no additional effects on the species or its habitat.

There would be no additional effects on state listed, sensitive species, but hiking groups could disturb and displace many sensitive species from their habitat. Good interpretive information and programs could have a positive benefit for sensitive species.

- **Alternative B** would limit group size for guided day hikes and the number of trips per day on high-traffic trails, but would also disturb and displace the bald eagle, grizzly bear gray wolf, and Canada lynx as in alternative A, having a minor adverse impact. There would be effect on bull trout.

Hiking groups could disturb and displace many state listed, sensitive species from their habitat, but in general, smaller groups would be less disruptive. Good interpretive information and programs could have a positive benefit for sensitive species.

Guided Underwater Diving Tours

- **Alternative A – Status Quo/No Action** would have no impact on any threatened and endangered or state listed sensitive species because guided underwater diving tours would not occur in the park.

Alternative B (Preferred). In and around Lakes McDonald, Sherburne and Josephine, and Swiftcurrent, Two Medicine, Pray, Lower Two Medicine and St. Mary Lakes, this alternative could result in trampling of vegetation in aquatic habitats, increased levels of noise in remote habitats, and increased human disturbance in adjacent habitats. It could also result in the introduction of non-native plant and animal species, increased turbidity, sanitary waste disposal problems, the deposit oil/gas mixtures on the water surface, and increased chance of human conflicts with threatened and endangered species. These would cause minor adverse impacts.

There could be minor to moderate effects to sensitive duck species from boat and diving activities, and to species using riparian areas if tours occurred close to shore.

- Bald Eagle. Diving activity and boats transporting divers could disturb bald eagles in foraging, breeding and wintering areas, particularly on popular lakes. The effects could be moderate, negative and short-term at those locations.
- Grizzly Bear. Diving activity close to shore and boats transporting divers could displace grizzly bears. The overall effect would be minor, adverse and short-term.
- Gray Wolf. This alternative could result in increased levels of visitor use in gray wolf habitat. Wolves are most sensitive to human disturbance at den and rendezvous sites (visitor access to these areas could be limited by seasonal closures to protect denning wolves). Ungulates could experience shifts in distribution as a response to increased levels of human disturbance. Any impacts to ungulates would be an indirect impact on gray wolves. Overall, this alternative would result in a minor and negative impact.
- Canada Lynx. Actions that adversely affect lynx would include higher levels of human access into lynx habitat and human activity at or near den sites. These actions would result in modified forested habitat, expanded range of competitors and/or predators, or reduced prey species populations, resulting in a minor, negative impact on the lynx and lynx habitat.
- Bull Trout. Underwater tours could have a minor effect on bull trout in Lake McDonald and St. Mary Lake. Operating plans would prohibit use in sensitive areas.

Firewood Sales

- **Alternative A – Status Quo/No Action** would continue firewood sales in campstores and would continue to have a negligible, long-term, positive effect on threatened and endangered species because campers would be less likely to disturb wildlife habitat by removing logs, trees, and branches for firewood. There would be no additional effects on sensitive species.
- **Alternative B (Preferred)**. Expanded firewood sales operations at developed campgrounds as well as campstores would mean that campers would be less likely to disturb threatened and endangered wildlife habitat by removing logs, trees, and branches for firewood; therefore, this alternative would have a negligible, long-term, positive effect. There may be a negligible, long-term improvement in habitat if more people are discouraged from illegal firewood gathering by the increased availability of firewood for sale.

Boat Tours and Transportation (Boat Taxi)

- **Alternative A – Status Quo/No Action**. Continued boat tour and transportation services would have no additional impacts on threatened and endangered species. No measurable change to existing habitats would occur. Continuation of commercial boat tours at Lakes McDonald and Josephine, and Two Medicine, St. Mary, Waterton, and Swiftcurrent Lakes would continue to negatively impact threatened and endangered species at those locations by displacement. However, this alternative also has a positive effect on wildlife because the educational value of the presence of a knowledgeable and experienced guide would result in positive impacts to human/wildlife interactions.

There would be no additional effects to sensitive species from current activities.

- Bald Eagle. Bald eagles nesting or foraging at these six lakes would continue to be disturbed by commercial tour boat operations, and eagles would continue to be displaced from optimal habitats by boat activity at these lakes.

- Grizzly Bear. This alternative would not alter grizzly bear habitat, nor change human-use patterns in or near areas that would likely be occupied by grizzly bears.
 - Gray Wolf. This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den or rendezvous sites in the future. Disturbance associated with ongoing commercial tour boat operations is not expected to influence ungulate population trends in distribution.
 - Canada Lynx. This alternative would not result in the alteration of vegetation, or changes in human activity that could influence prey species population trends in distribution, human access levels, or the range of lynx competitors and/or predators.
 - Bull Trout. There would be no change in effects from existing conditions.
- **Alternative B (Preferred)**. – Impacts noted in alternative A would apply to this alternative as well. Adding boats to Lake McDonald would have negligible, temporary effects on bull trout. Lengthening the dock would have minor, temporary, adverse effects on bull trout during construction from sediment. Adding boats to Lake McDonald and Two Medicine Lake, and new landings at Apgar could increase displacement of sensitive aquatic and bird species. Effects would be minor, long term and adverse.

Horseback Riding and Horse Packing Services

- **Alternative A – Status Quo/No Action (Preferred)**. No additional effects are expected in this alternative. Horseback riding and horse packing services would continue to cause minor to moderate, adverse impacts on some threatened and endangered species due to trampling of vegetation along trails, noise in remote habitats, human disturbance in adjacent habitats, and trail erosion. This alternative would also result in the continued influx of nutrients from livestock droppings and urine, continued sedimentation in streams and lakes, continued spread of non-native plant species, and human/wildlife conflicts. For the bald eagle, grizzly bear and gray wolf, existing conditions would not change. No measurable change to existing habitats would occur. The continued presence of a knowledgeable and experienced guide would continue to result in positive impacts to human/wildlife interactions. This alternative would continue to affect wildlife use of aquatic and terrestrial habitats throughout the park (with impacts concentrated in the vicinity of Many Glacier, Apgar, Granite Park Chalet, Sperry Chalet, and the Lake McDonald Lodge).

There would be no additional effects on sensitive species.

- Bald Eagle. No additional effects.
 - Grizzly Bear. This alternative would not alter grizzly bear habitat, nor change human-use patterns in or near areas that would likely be occupied by grizzly bears.
 - Gray Wolf. This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den or rendezvous sites in the future. Disturbance associated with ongoing guided horseback riding and horse packing is not expected to influence ungulate population trends in distribution.
 - Canada Lynx. Additional impacts to the lynx are not anticipated. This alternative would not result in the alteration of vegetation, or changes in human activity that could influence prey species population trends in distribution, human access levels, or the range of lynx competitors and/or predators.
 - Bull Trout. No new impacts would occur.
- **Alternative B** would have the same impacts as alternative A, but would result in a reduction of impacts due to the elimination of guided horseback riding on trails originating from the Apgar

stables. This alternative would have a minor to moderate, long-term positive impact on these species at Apgar. There would be an overall minor to moderate reduction in impacts if rides were discontinued in the Apgar area, including those to aquatic avian species along Lower McDonald Creek.

- Bald Eagle. Bald eagles foraging or roosting along Lower McDonald Creek and the foot of Lake McDonald would not be disturbed by large groups on guided horse trips.
 - Grizzly Bear. Grizzly bears foraging, resting, or traveling in the Lower McDonald Valley would not be disturbed by large groups on guided horse trips.
 - Gray Wolf. Gray wolves hunting or traveling in the Lower McDonald Valley would not be disturbed by large groups on guided horse trips.
 - Canada Lynx. Canada lynx hunting or traveling in the Lower McDonald Valley would not be disturbed by large groups on guided horse trips.
 - Bull Trout. Small reductions in nutrients and sediment could result from the discontinuation of rides in the Lower McDonald Valley. This would be a minor beneficial, long-term effect.
- **Alternative C** would have the same impacts as alternative A with an increase in impacts in the Two Medicine and St. Mary areas due to added horseback riding services in those areas. For all the threatened and endangered species listed below, the same impacts described for alternative A would continue under alternative C at all sites except Two Medicine and St. Mary where impacts would be increased due to the expansion of guided horseback riding services in these areas. This alternative could have moderate to major, long-term, negative impacts on these species, except the gray wolf, at Two Medicine and St. Mary. There would be an overall minor to moderate increase in impacts on sensitive species due to temporary disturbance if rides were added in the St. Mary and Two Medicine areas.
 - Bald Eagle. Bald eagles foraging, nesting, and roosting along in Two Medicine and St. Mary could be disturbed by large groups on guided horseback rides.
 - Grizzly Bear. Grizzly bears foraging, resting, and traveling in Two Medicine and St. Mary could be disturbed by large groups on guided horseback rides.
 - Gray Wolf. Gray wolves hunting, denning, and traveling in Two Medicine and St. Mary could be disturbed by large groups on guided horseback rides. This alternative would have moderate long-term, negative impacts on the gray wolf.
 - Canada Lynx. Canada lynx hunting, denning, and traveling in Two Medicine and St. Mary could be disturbed by large groups on guided horseback rides.
 - Bull Trout. Additional horseback rides in St. Mary could have minor long-term, adverse impacts.
 - **Alternative D** would have the same impacts as alternative A, but would result in a reduction of impacts associated with guided horseback riding and horse packing in the Lake McDonald area due to the removal of the stable and discontinued rides in the Upper McDonald Valley. For the threatened and endangered species below except the gray wolf, this alternative would have a minor long-term, positive impact at Lake McDonald. There would be a minor to moderate decrease in impacts, including those to harlequin ducks, from the closure of the Lake McDonald corral and discontinuation of rides up the Upper McDonald Valley. The effects would be long-term and positive.
 - Bald Eagle. Bald eagles foraging, nesting, or roosting at Lake McDonald would not be disturbed by large groups on guided horseback riding trips.

- Grizzly Bear. Grizzly bears foraging, resting, or traveling in the Upper McDonald Valley would not be disturbed by large groups on guided horseback riding trips.
- Gray Wolf. Gray wolves hunting or traveling in the Upper McDonald Valley would not be disturbed by large groups on guided horse trips. This alternative would have a negligible long-term, positive impact on gray wolves at Lake McDonald.
- Canada Lynx. Canada lynx hunting or traveling in the Lower McDonald Valley would not be disturbed by large groups on guided horse trips.
- Bull Trout. This alternative would reduce some nutrient loading and sedimentation to Lake McDonald and the upper valley, resulting in a beneficial, long-term effect.

Conclusion

Alternative A for Granite Park Chalet would have no additional impacts. Alternative B would have moderate short-term, adverse impacts on threatened and endangered species from disturbance and displacement, and alternative C would have the same impacts. In addition, the cessation of hauling sanitary waste by helicopter under alternatives B and C would cause minor long-term, positive impacts

Although alternative B for guided day hiking would have a less negative impact on threatened and endangered species than alternative A because it limits group sizes and the number of trips per day on high-traffic trails, human disturbances would have minor adverse impacts on some threatened and endangered species.

Under alternative A, guided underwater diving tours would not be available in the park; therefore, there would be no impact on park threatened and endangered species. Alternative B would have minor, adverse impacts.

Alternatives A and B for firewood sales would result in overall negligible long-term, positive impacts on threatened and endangered species near campgrounds by reducing disturbances from visitors gathering wood.

Alternative B for boat tours and transportation (boat taxi) would have minor, long-term effects on Lake McDonald. Alternative B would have increased negative effects on bald eagles at Lake McDonald and Waterton Lakes, and minor to moderate effects on Two Medicine Lake from disturbance caused by increased boat tours.

Alternatives B and D for horseback riding and packing services would have overall minor to moderate, localized, positive impacts. Impacts for alternative C would be the same as for alternative A, with the addition of localized impacts in the Two Medicine and St. Mary areas.

There would be no significant adverse impacts on threatened and endangered species whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of threatened and endangered species as a result of the implementation of any of the alternatives.

Apgar Village Developed Area

- **Alternative A – Status Quo/No Action.** The current conditions described in Chapter 3 Affected Environment would be maintained, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would have negligible to minor short-term, adverse impacts

during implementation to the grizzly bear, bald eagle, gray wolf, Canada lynx and bull trout. The small number of ground disturbing activities under this alternative would occur in a relatively small area that is previously disturbed by human activities. As a result of the disturbed nature of the site and adjacent development, long-term impacts would be negligible for all of the threatened and endangered species listed below except the bull trout.

- Bald Eagle. No other changes would occur.
- Grizzly Bear. This alternative would not affect grizzly bear habitat, nor change human-use patterns in or near areas that would likely be occupied by grizzly bears.
- Gray Wolf. This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den or rendezvous sites in the future.
- Canada Lynx. This alternative would not change the existing conditions associated with this species; therefore, additional impacts to the lynx are not anticipated.
- Bull Trout. Formalizing and hardening pedestrian pathways along the shoreline would reduce the amount of lakeside soil and vegetation available to filter sediments and pollutants in runoff from the surrounding developed area. Developing hardened pathways along the shoreline would increase localized runoff and would have a minor long-term, adverse impact. An increase in human use at the outlet could have minor impacts.

There would be no additional effects on sensitive species.

- **Alternative B (Preferred)**. This alternative would have the same negligible to minor, short-term impacts as described in alternative A. However, any construction in the spring, fall and winter would have moderate adverse impacts, since these are sensitive seasons for most threatened and endangered species in the park. Adverse impacts would be negligible to minor and short-term, depending on the season of trail construction. If construction occurs in the summer, impacts would be negligible. Construction of the parking lots and other visitor-related facilities in the summer would have less adverse, short-term effects. However, construction during this season on trails that run through habitat that could be occupied by threatened and endangered species would have greater adverse effects.

Construction during spring, fall or winter could result in the alteration of human-use patterns in or near areas that would likely be occupied by grizzly bears, which could lead to an increased chance of conditioning bears to human food and creating human/bear conflicts, thereby creating a moderate, adverse impact.

Construction work in late or early season could potentially have short-term adverse impacts on wolverine. Additional parking lots may result in a minor loss of habitat from clearing and hazard tree removal for sensitive bird species dependent on mature trees or snags. The result would be minor negative, long-term effects.

Extending the operating season of the Village Inn eight weeks (three weeks earlier and five weeks later) could affect threatened, endangered and sensitive wildlife species by encouraging more visitor use in the spring and fall at Apgar. This could displace or alter travel routes for grizzly bears, Canada lynx and wolves. This could also disturb bald eagles roosting and feeding along McDonald Creek. Increased activity during the spring and fall could affect energy expenditure, productivity and increase mortality. Overnight visitors might also impact other nearby areas since the duration and time of their stay would be different than for day users. The effects would be negative, minor to moderate and long-term.

- **Alternative C.** Impacts described for alternatives A and B, including extending the operating season, would remain the same under this alternative with the following exception: replacing the Village Inn with a formalized public space may increase the amount of human disturbance to the bull trout at the outlet and along Lower McDonald Creek in spring, fall and winter, resulting in a minor long-term impact.

Impacts on sensitive species would be the same as in alternative B, but removal of the Village Inn would have minor to moderate, adverse impacts on sensitive species using the outlet, lower lake and riparian area including several duck species and loss of habitat for some bird species with the relocation. Minor to moderate adverse, long-term effects would result.

- **Conclusion.** All alternatives would have minor short-term, localized adverse impacts on threatened and endangered species as well as minor long-term, localized adverse impacts on the bull trout. Alternative B may have moderate adverse impacts during any construction that occurs in the spring, fall and winter since these are sensitive seasons for most threatened and endangered species in the park. Alternative C may have a minor, long-term impact on the bull trout due to the increase of human disturbance at the outlet and along Lower McDonald Creek in spring, fall and winter. The effects of extending the season would be negative, minor to moderate and long-term.

There would be no significant adverse impacts on threatened and endangered species whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of any threatened and endangered species as a result of the implementation of any of the alternatives.

Lake McDonald Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions described in Chapter 3 Affected Environment would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would have minor short-term, adverse impacts during implementation due to construction noise and general disturbances to the area. The following threatened and endangered species would be temporarily affected: bald eagle, grizzly bear, gray wolf, Canada lynx, and bull trout.

Formalizing and hardening pedestrian pathways along the shoreline would reduce the amount of lakeside soil and vegetation available to filter sediments and pollutants in runoff from the surrounding developed area.

- **Bald Eagle, Grizzly Bear.** Because this alternative is not likely to alter human use, construction and maintenance activities at the Lake McDonald developed area, it would not result in any additional impacts on these species.
- **Gray Wolf.** This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den or rendezvous sites in the future. Most use would be by individuals habituated to high levels of human activity. Therefore, no additional impacts to this species are expected.
- **Canada Lynx.** This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den sites in the future. Neither alteration of vegetation within the developed area, nor changes in human activity patterns associated with construction during the winter, fall, or spring is expected to influence prey species population trends in

distribution, human access levels, or the range of lynx competitors and/or predators. Use by lynx during the summer is expected to continue at current levels with the continuation of normal maintenance and operation of the Lake McDonald Lodge and associated visitor services. Therefore, no adverse effects to lynx or their prey are expected as a result of this alternative.

- Bull Trout. Construction might increase localized runoff and have a minor long-term, adverse impact. Construction of new parking lots near Snyder Creek and new buildings could have minor localized, short-term, adverse impacts.

There would be no additional effects on sensitive species.

- **Alternative B.** Impacts described under alternative A also apply to this alternative.

Development proposed under this alternative is expected to have minor adverse impacts on the bald eagle, grizzly bear, gray wolf, and Canada lynx, due to the existing development in the area and the limited area that would be affected. Sediments and pollutants in increased water run-off from the expanded paved surface area would cause minor to moderate long-term, localized, adverse impacts on the bull trout.

Removing Boys' Dormitories 1 and 2 as well as the Johnson, Jammer and Hydro dormitories from Area I, and removing the existing Coffee Shop parking lot and Girls' Dormitories 1 and 2 from Area II would result in some revegetation. This action would have a negligible long-term, positive impact on threatened and endangered species given the small area affected and the proximity of adjacent development.

The new employee housing area proposed near the Coffee Shop would result in expanded human presence in the adjacent forested habitat; however, human presence and adjacent development have previously disturbed this area. As a result of the disturbed nature of the site, adverse impacts on and endangered species from new facilities would be minor. Short-term impacts associated with construction would be minor in all seasons, given the magnitude of the project. Parking lot and road improvement projects north of Snyder Creek would have minor long-term impacts due to loss of habitat. If construction is scheduled during spring, fall or winter, short-term impacts would be of minor to moderate intensity because these seasons are sensitive for most threatened and endangered species in the park.

Construction work during the early or late seasons could potentially have adverse impacts on wolverine. Additional development may result in a minor loss of habitat for boreal toads from clearing and loss of habitat for sensitive bird and bat species dependent on mature trees or snags from clearing and hazard tree removal. Minor adverse, long-term effects would occur. Removal of buildings in the riparian zone would result in a negligible improvement to habitat for several species.

Extending the operating season of the Lake McDonald Lodge, General Store, Coffee Shop, and other visitor accommodations five weeks (two weeks earlier and three weeks longer) would affect wildlife by displacing species from habitat within and adjacent to the developed area during the sensitive spring and fall seasons. Increased activity during this time could affect energy expenditure and productivity and increase mortality. The effects would be most pronounced on bald eagles roosting or feeding in the area, or grizzly bears traveling adjacent to the area.

Overnight users may also impact other nearby areas since the duration and time of their stay would be different than for day users. The effects would be negative, minor to moderate and long-term.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B remain the same under this alternative for threatened and endangered species and species of concern. Impacts to sensitive species would be the same as under alternative B.
- **Conclusion.** Alternatives A, B and C would have minor short-term, adverse impacts during implementation due to construction noise and general disturbances to the area to the grizzly bear, gray wolf, and Canada lynx. Extending the season would have negative, minor to moderate, long-term impacts.

There would be no significant adverse impacts on threatened and endangered species whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of any threatened and endangered species as a result of the implementation of any of the alternatives.

Rising Sun Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions as described in Chapter 3 Affected Environment would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would have minor short-term, adverse impacts during implementation on the bald eagle, grizzly bear, gray wolf, and Canada lynx. The general maintenance proposed under this alternative would result in additional minor adverse impacts on threatened and endangered species unless activities are implemented during the current maintenance and operating season; then there would be no additional long-term effect on threatened and endangered or sensitive species.
 - **Bald Eagle.** Because no new development would occur under this alternative, direct loss of eagle habitat or removal of important habitat components such as foraging perches or screening vegetation would not occur due to management actions. Available habitat and opportunities for nesting, perching, foraging, and roosting in the St. Mary Valley would continue to be limited by development and associated use.
 - **Grizzly Bear.** Since no additional disturbance of forest or grassland habitats is proposed, there would be no additional effects on the grizzly bear. This alternative would not affect habitat, or change human-use patterns in or near areas that would likely be occupied by grizzly bears.
 - **Gray Wolf.** This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den or rendezvous sites in the future. Most use would be by individuals habituated to high levels of human activity.
 - **Canada Lynx.** This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den sites in the future. Alteration of vegetation within the developed area, or changes in human activity patterns associated with construction during the winter, fall, or spring would not be expected to influence prey species population trends in distribution, human access levels, or the range of lynx competitors and/or predators. Use by lynx during the summer is expected to continue at current levels with the continuation of normal maintenance and operation of the Rising Sun developed area.
 - **Bull Trout.** This alternative would not affect known or potential bull trout habitat.

- **Alternative B.** Impacts described under alternative A also apply to this alternative. Constructing five new cabins with parking in Area I, as well as a new employee dormitory with parking and an outdoor recreation facility, would result in some loss of habitat, but the adverse impacts on threatened and endangered species would be minor and long-term, except during construction. Proposed construction activities would result in negligible short-term, adverse impacts in summer; and minor to moderate, short-term, adverse impacts in spring or fall. In winter, these activities would cause moderate short-term, adverse impacts on the bald eagle, grizzly bear, gray wolf and Canada lynx. Raising the berm and stabilizing the bank at the cabin circle would have negligible effects on known or potential bull trout habitat.

Construction work during the early or late seasons could potentially have adverse impacts on wolverine and golden eagles. The small loss of habitat could result in minor impacts on several bird and possibly bat species. Removal of the boat concession house could have a negligible, long-term impact on species using the riparian area or lake, although the dock and parking area would remain.

Extending the operating season of the visitor overnight accommodations, Coffee Shop and General Store/Motel/Dormitory five weeks (three weeks earlier and two weeks longer) would displace threatened, endangered and sensitive wildlife species from habitat within and adjacent to the developed area during the sensitive spring and fall seasons. Increased activity during this time could affect energy expenditure and productivity and increase mortality. Overnight visitors might also impact other nearby areas since the duration and time of their stay would be different than for day users. Wolves have been documented in the meadows adjacent to the developed area in association with the elk herd, and bald eagles roost and feed along the shoreline of St. Mary Lake. The effects would be negative, minor to moderate and long-term.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative with the following exceptions.

Constructing 10 new cabins and associated parking, and two new employee dormitories including an outdoor recreation facility in Area I would result in increased habitat loss, but the adverse impacts on threatened and endangered species would be continue to minor and long-term, except during construction. Proposed construction activities would result in negligible short-term, adverse impacts in summer; and minor to moderate, short-term, adverse impacts in spring or fall. In winter, these activities would cause moderate short-term, adverse impacts on the bald eagle, bull trout, grizzly bear, gray wolf and Canada lynx.

Impacts on sensitive species would be the same as under alternative B, but with slightly more habitat loss.

- **Conclusion.** Although alternatives B and C propose development, the overall area to be impacted would be two acres or less. All alternatives would have minor long-term, localized, adverse impacts on the bald eagle, grizzly bear, gray wolf and Canada lynx except during construction. Proposed construction activities would result in negligible short-term, adverse impacts in summer; minor to moderate, adverse, short-term impacts in spring or fall and moderate short-term impacts in the winter. There would be no effect or effects would be negligible on known or potential bull trout habitat. Extending the operating season would have negative, minor to moderate, long-term effects on threatened and endangered, and state listed species.

There would be no significant adverse impacts on threatened and endangered species whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of threatened and endangered species as a result of the implementation of any of the alternatives.

Two Medicine Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions as described in Chapter 3 Affected Environment would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would result in minor to negligible, short-term, adverse impacts on these species during implementation. There would be no additional impacts on sensitive species.
 - **Bald Eagle.** No new development would occur under this alternative. Consequently, direct loss of eagle habitat or removal of important habitat components such as foraging perches or screening vegetation would not occur due to management actions. Available habitat and opportunities for nesting, perching, foraging, and roosting in the Two Medicine Valley would continue to be limited by development and associated use.
 - **Grizzly Bear.** Under this alternative, no additional disturbance of forest or grassland habitats is proposed; therefore, it would have no additional effects on the grizzly bear. This alternative would not affect grizzly bear habitat, nor change human-use patterns in or near areas that would likely be occupied by grizzly bears.
 - **Gray Wolf.** This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den or rendezvous sites in the future. Most use would be by individuals habituated to high levels of human activity. Therefore, no additional impacts to this species are expected.
 - **Canada Lynx.** This alternative would not alter habitats or human use patterns in or near areas that could contain suitable habitat for lynx den sites. Neither alteration of vegetation within the developed area, nor changes in human activity patterns associated with construction during the winter, fall, or spring is expected to influence prey species population trends in distribution, human access levels, or the range of lynx competitors and/or predators. Use by lynx during the summer is expected to continue at current levels with the continuation of normal maintenance and operation of the Two Medicine developed area.
 - **Bull Trout.** There would be no effect, since there is no known population in this area.
- **Alternative B (Preferred).** Impacts described under alternative A also apply to this alternative. The overall impact on the bald eagle, grizzly bear, gray wolf, and Canada lynx would be minor to negligible, short-term and adverse due to the minor new construction of walkways and increased levels of human disturbance. There would be no effect on bull trout.

Construction work during the early or late seasons could have moderate to major, short-term, adverse impacts on wolverine, golden eagles and bighorn sheep, but the small amount of overall disturbance should result in negligible effects on other species.

Extending the operating season for the General Store four weeks (one week earlier and three weeks later) might displace some threatened, endangered and sensitive wildlife species adjacent to the store but the effects would be negligible, negative and long-term.

- **Conclusion.** Overall, alternatives A and B would have minor to negligible short-term, localized, adverse impacts on threatened and endangered species from repairs, improvements, minor construction and increased levels of human disturbance. Extending the operating season would have negligible, negative, long-term effects.

There would be no significant adverse impacts on threatened and endangered species whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of threatened and endangered species as a result of the implementation of any of the alternatives.

Many Glacier Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions described in Chapter 3 Affected Environment would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would have minor to negligible, short-term adverse impacts during construction on the following species: the bald eagle, grizzly bear, gray wolf, Canada lynx, and bull trout. There would be no additional effects on sensitive species.
 - **Bald Eagle.** This alternative would not affect bald eagle habitat, nor change human-use patterns in or near areas that would likely be occupied by bald eagles in the future.
 - **Grizzly Bear.** Under this alternative, no additional disturbance of forest or grassland habitats is proposed; therefore, it would have no additional effects on the grizzly bear. This alternative would not affect grizzly bear habitat, nor change human-use patterns in or near areas that would likely be occupied by grizzly bears.
 - **Gray Wolf.** This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den or rendezvous sites in the future. Most use would be by individuals habituated to high levels of human activity. Therefore, no additional impacts to this species are expected.
 - **Canada Lynx.** This alternative would not alter habitats or human use patterns in or near areas that could contain suitable habitat for lynx den sites. Alternative A would not change the existing conditions associated with this species; therefore, additional impacts to the lynx are not anticipated.
 - **Bull Trout.** There would be no effects. Only one population is known to exist in the Many Glacier geographic area.
- **Alternative B.** Impacts described under alternative A also apply to this alternative. The small number of ground disturbance activities proposed under this alternative would occur in a relatively small area previously disturbed by human activities. The overall habitat area to be impacted by construction would be two acres or less. Proposed construction activities would result in negligible short-term, adverse impacts in summer, minor to moderate short-term, adverse impacts in spring/fall, and moderate to major short-term, adverse impacts in winter. Expanding the construction season would increase the intensity of associated impacts because it would greatly increase the level of human disturbance during the sensitive spring and fall seasons. There would be no effect on bull trout.

Construction work during the early or late seasons could have moderate to major, short-term, adverse impacts on wolverine, golden eagles and bighorn sheep. There would be negligible effect on other species because of the small loss of habitat and proximity to other development.

Extending the operating dates of the Many Glacier Hotel and other accommodations two weeks (one week earlier and one week later) would displace threatened, endangered and sensitive wildlife species from habitat within and adjacent to the developed area during the sensitive spring and fall seasons. Opening the hotel and related facilities requires staff to be present in the valley five to six weeks prior to opening. Increased activity during the extension could affect energy expenditure and productivity and increase mortality. The area is used extensively by grizzly bears in the spring and fall. Recent sightings have confirmed that wolves, wolverine, and Canada lynx also use the area in the spring and fall. The hotel and related buildings are in the middle of a travel corridor and winter range for bighorn sheep. The effects would be more pronounced because the operating dates for both the Many Glacier and Swiftcurrent facilities would be extended, since they are in the same valley. Overnight visitors might also affect wildlife in other nearby areas since the duration and time of their stay would be different than for day users. The effects would be negative, minor to moderate and long-term.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative. While some increased development is proposed, the overall habitat area impacted by construction is two acres or less. Proposed construction activities would result in negligible short-term, adverse impacts in summer, minor to moderate short-term, adverse impacts in spring/fall, and moderate to major short-term, adverse impacts in winter. Expanding the construction season would increase the intensity of associated impacts because it would greatly increase the level of human disturbance during the sensitive spring and fall seasons.

Construction during the early or late seasons could have moderate to major short-term, adverse impacts on wolverine, golden eagles and bighorn sheep. There would be minor to moderate, long-term loss of habitat and obstruction of migration routes for bighorn sheep by additional dormitories on the hill above the hotel.

- **Conclusion.** Although alternatives B and C proposed development, the overall area to be impacted would be two acres or less. All alternatives would have minor long-term, localized, adverse impacts on the bald eagle, grizzly bear, gray wolf and Canada lynx except during construction. Proposed construction activities would result in negligible short-term, adverse impacts in summer; minor to moderate, short-term, adverse impacts in spring or fall and moderate to major, short-term impacts in the winter. There would be no effect on bull trout from any of the alternatives. Extending the operating dates would result in negative, minor, long-term and positive effects.

There would be no significant adverse impacts on threatened and endangered species whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of threatened and endangered species as a result of the implementation of any of the alternatives.

Swiftcurrent Developed Area

- **Alternative A – Status Quo/No Action.** Current conditions as described in Chapter 3 Affected Environment would be maintained under this alternative, and maintenance of existing visitor facilities would be ongoing. Improvements and repairs would have minor short-term, adverse

impacts on the bald eagle, grizzly bear, gray wolf and Canada lynx during construction. Given the proximity of the Swiftcurrent developed area to the Many Glacier developed area and the location of both in the same drainage system, existing conditions for threatened and endangered species in the Swiftcurrent Valley are the same as those described for alternative A at Many Glacier. There would be no additional effects on sensitive species.

- Bald Eagle. This alternative would not affect bald eagle habitat, nor change human-use patterns in or near areas that would likely be occupied by bald eagles in the future.
 - Grizzly Bear. Under this alternative, no additional disturbance of forest or grassland habitats is proposed; therefore, it would have no additional effects on the grizzly bear. This alternative would not affect grizzly bear habitat, nor change human-use patterns in or near areas that would likely be occupied by grizzly bears.
 - Gray Wolf. This alternative would not alter habitats or human use patterns in or near areas that could potentially serve as den or rendezvous sites in the future. Most use would be by individuals habituated to high levels of human activity. Therefore, no additional impacts to this species are expected.
 - Canada Lynx. This alternative would not alter habitats or human use patterns in or near areas that could contain suitable habitat for lynx den sites. Alternative A would not change the existing conditions associated with this species; therefore, additional impacts to the lynx are not anticipated.
 - Bull Trout. There would be no effect on this species.
- **Alternative B (Preferred)**. Impacts described under alternative A also apply to this alternative. The small number of ground disturbance activities proposed under this alternative would occur in a relatively small area previously disturbed by human activities. The overall habitat area impacted by construction is four acres or less. Proposed construction activities would result in negligible short-term, adverse impacts in summer, minor to moderate short-term, adverse impacts in spring/fall, and moderate to major short-term, adverse impacts in winter. Expanding the construction season would increase the intensity of associated impacts because it would greatly increase the level of human disturbance during the sensitive spring and fall seasons. There would be no effect on bull trout.

Construction work during the early or late seasons would have moderate to major, long-term, adverse impacts on wolverine, golden eagles and bighorn sheep. There would be a minor loss of habitat for other species, but the effects would be minimal because of the proximity to the rest of the development.

Extending the operating dates of the visitor accommodations and Restaurant/Store three weeks (two weeks earlier and one week later) would displace wildlife species from habitat within and adjacent to the developed area during the sensitive spring and fall seasons. Opening the inn and related facilities requires staff to be present in the valley five to six weeks prior to opening. Increased activity during this time could affect energy expenditure and productivity, and increase mortality. The area is used extensively by grizzly bears in the spring and fall. Recent sightings have confirmed that wolves, wolverine, and Canada lynx also use the area in the spring and fall. The inn and related buildings are in the middle of a travel corridor and winter range for bighorn sheep. Overnight visitors may also impact wildlife in other nearby areas since the duration and time of their stay would be different than for day users. The effects would be negative, minor to moderate and long-term.

- **Alternative C**. Applicable impacts described for alternatives A and B, including extending the operating season, remain the same under this alternative. While there this alternative proposes

some increased development, the overall habitat area impacted by construction is four acres or less. Proposed construction activities would result in negligible short-term, adverse impacts in summer, minor to moderate short-term, adverse impacts in spring/fall, and moderate to major short-term, adverse impacts in winter. Expanding the construction season would increase the intensity of associated impacts because it would greatly increase the level of human disturbance during the sensitive spring and fall seasons. There would be no effect on bull trout.

Impacts on sensitive species would be the same as under alternative B.

- **Conclusion.** Although alternatives B and C propose development, the overall area impacted is four acres or less. All alternatives would have minor long-term, localized, adverse impacts on the bald eagle, grizzly bear, gray wolf and Canada lynx except during construction. Proposed construction activities would result in negligible short-term, adverse impacts in summer; minor to moderate, short-term, adverse impacts in spring or fall and moderate short-term impacts in the winter. There would be no effect on bull trout. Extending operation dates would have negative, minor to moderate impacts.

There would be no significant adverse impacts on threatened and endangered species whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of threatened and endangered species as a result of the implementation of any of the alternatives.

Wildlife Cumulative Impacts

During the history of Glacier National Park, development to accommodate visitors and steady growth in park visitation have affected threatened and endangered species through loss of habitat and disturbance from increasing human presence. Impacts on these species extend beyond physical boundaries because some species are less likely to use habitats near heavily used areas such as roads, trails, campgrounds and other developments.

In areas throughout and adjacent to the park, past actions such as development have affected threatened and endangered species. Present ongoing services within the park disturb these species' habitat in developed areas, along roads and trails, and near lakes and rivers. These services also contribute to habitat displacement. Reasonably foreseeable projects outside the park such as constructing additional employee housing, improving roads and bridges, and U.S. Forest Service timber salvaging and trail construction would have localized adverse impacts on threatened and endangered species. Future development projects inside the park, including the Going-to-the-Sun Road rehabilitation project that could cause loss of habitat in areas with little or no existing disturbance, would have moderate site-specific, adverse impacts on threatened and endangered species. The combined impacts of all actions both inside and outside the park, and any of the alternatives would have an overall minor to moderate, regional, long-term, adverse cumulative impact on any threatened and endangered species.

Plant Species

Methodology

Current vegetation conditions were assessed through consultation with the park's staff ecologist and biological technicians, synthesis of research reports and databases, and field surveys conducted during the summer of 2001. There are no known occurrences of federally listed threatened or endangered plant species in the park. The park likely holds suitable habitat for the federally listed water howellia (*Howellia aquatilis*), and may hold suitable habitat for the federally listed Spalding's catchfly (*Silene spaldingii*). Montana Natural Heritage Program databases and park research project reports were used to compile information used in this document. Refer to Tables 3.3 - 3.5.

A federal candidate species, the slender moonwort (*Botrychium lineare*) is found in the Many Glacier Valley. No plant species of concern have been identified in the Lake McDonald, Many Glacier, Swiftcurrent, Two Medicine or Rising Sun developed areas, or Granite Park, although additional field surveys would be conducted in summer of 2003.

Thresholds of impact are defined in Table 4.1.

- *Negligible*: 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.
- *Minor*: 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 affect" 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.
- *Moderate*: An individual or population of a listed species, or its critical habitat would be noticeably affected. The effect could have some consequence to individuals, population, or habitat. Moderate effect would equate with a "may affect" 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.
- *Major*: 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 affect" 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*: After implementation, would recover in less than 1 year.
- *Long-term*: After implementation, would take more than 1 year to recover.

Impact Analysis For Necessary and Appropriate Services Alternatives

For other necessary and appropriate activities, the limited sensitive plant surveys parkwide have not indicated direct or potential conflicts with the alternatives. In general, alternatives that limit group size (guided day hiking, alternative B) or reduce usage (horseback riding and horse packing services, alternatives B and D), pose the least threat to potentially impact sensitive plant species or habitat. Therefore, the analyses are similar to the consequences described for vegetation.

Apgar Village Developed Area

- **Alternative A – Status Quo/No Action.** There would be no impacts to plant species of concern.
- **Alternative B.** Impacts could be negligible to minor, negative and long-term on the velvet-leaved huckleberry and slender moonwort from construction of a bicycle path to the campground.
- **Alternative C.** Under alternative C, the construction of a new paved bicycle path around the southeast periphery of the Apgar Village developed area could potentially impact individual velvet-leaved blueberry plants; however, the exact route of the proposed bicycle path has not yet been finalized. Once a route is specified, mitigation measures, including a thorough survey of the proposed route for velvet-leaved blueberry, would reduce or eliminate the potential negative impact. If individual velvet-leaved blueberry plants were impacted, adverse effects would be negligible to minor, long-term.

Many Glacier Developed Area

- **Alternatives B and C** propose to provide an information/orientation pull-off on Many Glacier Road. A site along the road near Packer’s East supports slender moonwort (*Botrychium lineare*), a federal candidate species, which is only found in the Many Glacier Valley. Detailed site plans for the pull-off have not yet been determined. Potential impacts will be assessed once detailed site plans are developed. Also, extending the operation dates of Many Glacier and Swiftcurrent would require early plowing of the Many Glacier Road. This could have a major, adverse, long-term effect on the slender moonwort.

Swiftcurrent Developed Area

- **Alternative B.** Plowing operations needed for earlier access could affect the slender moonwort plant population. The effects would be more pronounced by extending the operating dates for both the Many Glacier and Swiftcurrent facilities, since they are in the same valley.

Conclusion

Apgar Village alternatives B and C could have minor long-term, site-specific, adverse impacts if individual velvet-leaved blueberry plants are impacted by the construction of a bicycle path.

The information/orientation pull-off along Many Glacier Road would be located to avoid adverse effects on plant species of concern. Sites surveys would be conducted during design. Early plowing could have a major negative, long-term effect.

There would be no significant adverse impacts on federally or state listed plant species whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of federally or state listed plant species as a result of the implementation of any of the alternatives.

Plant Cumulative Impacts

Special status plant species could be impacted by a variety of future projects. Reasonably foreseeable future projects outside the park such as roadwork and U.S. Forest Service timber salvage operations could cause disturbance or removal of individual federally or state-listed plants. Other planned

projects inside the park, including the Going-to-the-Sun Road rehabilitation project and the construction of the West Side Discovery Center, which could include removal of individual velvet-leaved blueberry plants, would introduce additional disturbance. The cumulative effect of all of these actions and any of the alternatives could cause minor long-term, adverse impacts.

NATURAL SOUNDS

Methodology

Sound levels in the park were assessed through field visits and consultation with Glacier National Park staff. Alternatives were evaluated based on current sound levels and information gathered from other environmental assessments and environmental impact statements, as well as current literature reviews.

Thresholds of impact are defined in Table 4.1.

- *Negligible:* Effects would not be perceptible.
- *Minor:* Effects would result in an increase in noise levels in localized areas.
- *Moderate:* Effects would result in a readily detectable, widespread introduction of noise.
- *Major:* Effects would result in an introduction of noise.
- *Short-term:* Would occur during implementation.
- *Long-term:* Would be permanent.

Impacts Common to All Alternatives

All alternatives involving construction and/or repair would introduce temporary but increased noise into the park; however, these actions would take place in developed areas where existing noise from traffic, concessioner operations and visitor services is common. Increased noise introduced during construction would be loudest near the point of generation and would decrease with distance from the source. Typical noises associated with construction activities would be caused by equipment such as

trucks, bulldozers, hand tools and other machinery, and by additional human activity in work areas. Various measures would be implemented to minimize construction-related noise, including equipping construction equipment with adequate mufflers and scheduling work activities to avoid early morning or night work near lodges, campgrounds and sensitive wildlife habitat. Impacts related to construction, demolition and maintenance activities would be minor, short-term, and negative during implementation.



Impact Analysis For Necessary and Appropriate Services Alternatives

Granite Park Chalet, Public Showers

- **Alternative A – Status Quo/No Action.** Minor long-term, adverse impacts would result from the recurring removal of waste from toilet facilities.

- **Alternative B (Preferred).** Increased noise associated with construction and maintenance activities under alternatives B and C for Granite Park Chalet and alternative B for public showers would cause short-term adverse impacts. Impacts from increased noise during construction would be localized and have an overall minor effect on natural sound.

Guided Day Hiking (Cultural/Natural/Recreational)

- **Alternative A – Status Quo/No Action.** Continuing to provide guided day hiking services would have no additional impact on natural sound.
- **Alternative B (Preferred).** Limiting group size and the number of trips per day on high-traffic trails would not dramatically change noise levels.

Boat Tours and Transportation (Boat Taxi)

- **Alternative A – Status Quo/No Action.** Park tour and transportation boats do not operate at high speeds and produce significant noise. Under alternative A, current interpretive boat tours and transportation services would have no additional impact on natural sound.
- **Alternative B (Preferred).** Added tour boat services on Lake McDonald and Two Medicine would not dramatically increase noise in the Lower McDonald Creek and Two Medicine drainages.

Guided Interpretive Motor Vehicle Tours and Public Transportation

- **Alternatives A and B (Preferred).** Motor vehicle tours, shuttle services, taxi services and private vehicle shuttle services do not significantly affect the existing noise level from existing park traffic. Alternatives A and B would not impact current natural sound along park roads.

Horseback Riding and Horse Packing Services

- **Alternatives A – Status Quo/No Action (Preferred), B, C and D.** Horseback riding and horse packing services would continue to introduce noise from visitors, guides and stock in areas where natural sound is predominant. Guided horseback riding services, however, do not increase noise levels significantly above those that occur from private horse use. Alternatives A, B, C and D would all have negligible negative impacts on natural sound.

Guided Bicycle Tours

- **Alternatives A and B (Preferred).** Guided bicycle tours would be restricted to roads and bicycle paths within the visitor services zone of all management areas with the exception of the North Fork area, and in the rustic zone of the Apgar Lookout, the 1913 Ranger Station and the Cut Bank area. Currently, there is noise associated with vehicle traffic in all of these areas, but guided bicycle tours would not have any effect on natural sound.

Conclusion

The Granite Park Chalet and public showers action alternatives would cause overall minor short-term, localized, adverse impacts from increased noise associated with construction.

Guided day hiking services, boat tours and transportation (boat taxi), guided interpretive motor vehicle tours and transportation, and guided bicycle tours would have no new effect on natural sound.

Alternatives A, B, C and D for horseback riding and horse packing services would all have negligible long-term, localized, negative impacts.

There would be no significant adverse impacts on natural sound whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of natural sound as a result of the implementation of any of the alternatives.

Apgar Developed Area

- **Alternative A – Status Quo/No Action.** Increased noise associated with construction and maintenance activities would cause adverse, short-term impacts. Impacts from increased noise during construction would be localized and have an overall minor effect on natural sound.
- **Alternative B.** Impacts described in alternative A also apply to this alternative. Extending the operating season of the Village Inn eight weeks (three weeks earlier and five weeks later) could affect natural sound by encouraging more visitor use during the early and late seasons at Apgar. The result could be additional noise from vehicles and other activities than currently exists during these times. The effects would be negative, minor and long-term.
- **Alternative C.** Impacts for alternatives A and B, including extending the operating season, remain the same for this alternative.

Conclusion. All alternatives would have minor adverse, short-term impacts from construction and maintenance. In addition, alternatives B and C would have minor negative, long-term effects on natural sound from increased visitor use due to an extended operating season.

There would be no significant adverse impacts on natural sound 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of natural sound as a result of the implementation of any of the alternatives.

Lake McDonald Developed Area

- **Alternative A – Status Quo/No Action.** Increased noise associated with construction and maintenance activities would cause short-term adverse impacts. Impacts from increased noise during construction would be localized and have an overall minor effect on natural sound.
- **Alternative B.** Extending the operating season of the Lake McDonald Lodge, General Store, Coffee Shop and other visitor accommodations five weeks (two weeks earlier and three weeks longer) would effect natural sound by increasing human activities such as vehicle use and other actions associated with running and operating the facilities. The effects would be negative, minor and long-term.
- **Alternative C.** Impacts for alternative B remain the same for this alternative.

Conclusion. All alternatives would have minor adverse, short-term impacts from construction and maintenance. In addition, alternatives B and C would have minor negative, long-term effects from increased activity due to an extended operating season.

There would be no significant adverse impacts on natural sound 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of natural sound as a result of the implementation of any of the alternatives.

Rising Sun Developed Area

- **Alternative A – Status Quo/No Action.** Increased noise associated with construction and maintenance activities would cause short-term adverse impacts. Impacts from increased noise during construction would be localized and have an overall minor, negative effect on natural sound.
- **Alternative B.** Extending the operating season of the visitor overnight accommodations, Coffee Shop and General Store/Motel/Dormitory five weeks (three weeks earlier and two weeks longer) would affect natural sound by increasing activities and related noise from traffic and operation of the facilities. The effects would be negative, minor and long-term.
- **Alternative C.** Impacts for alternative B remain the same for this alternative.

Conclusion. All alternatives would have minor adverse, short-term impacts from construction and maintenance. In addition, alternatives B and C would have minor negative, long-term effects from an increased activity due to an extended operating season.

There would be no significant adverse impacts on natural sound 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of natural sound as a result of the implementation of any of the alternatives.

Two Medicine Developed Area

- **Alternative A – Status Quo/No Action.** Increased noise associated with construction and maintenance activities would cause short-term adverse impacts. Impacts from increased noise during construction would be localized and have an overall minor, negative effect on natural sound.
- **Alternative B.** Extending the operating season for the General Store four weeks (one week earlier and three weeks later) would have negligible, negative, long-term impacts from a slight increase in use of the area.
- **Conclusion.** All alternatives would have minor adverse, short-term impacts from construction and maintenance. In addition, alternatives B and C would have minor negative, long-term effects from a slight increase in use due to an extended operating season.

There would be no significant adverse impacts on natural sound 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of natural sound as a result of the implementation of any of the alternatives.

Many Glacier Developed Area

- **Alternative A – Status Quo/No Action.** Increased noise associated with construction and maintenance activities would cause short-term adverse impacts. Impacts from increased noise during construction would be localized and have an overall minor, adverse effect on natural sound.
- **Alternative B.** Extending the operating dates of the Many Glacier Hotel and other accommodations two weeks (one week earlier and one week later) would affect natural sound by increasing activities and related noise from traffic and operation of the facilities. The effects would be more pronounced from extending the operating dates for both the Many Glacier facilities and Swiftcurrent facilities, since they are in the same valley. The effects would be negative, minor and long-term.
- **Alternative C.** Impacts for alternative B remain the same for this alternative.

Conclusion. All alternatives would have minor adverse, short-term impacts from construction and maintenance. In addition, alternatives B and C would have minor negative, long-term effects from increased activity due to an extended operating season.

There would be no significant adverse impacts on natural sound 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of natural sound as a result of the implementation of any of the alternatives.

Swiftcurrent Developed Area

- **Alternative A – Status Quo/No Action.** Increased noise associated with construction and maintenance activities would cause short-term adverse impacts. Impacts from increased noise during construction would be localized and have an overall minor, negative effect on natural sound.
- **Alternative B.** Extending the operating dates of the visitor accommodations and Restaurant/Store three weeks (two weeks earlier and one week later) would affect natural sound by increasing activities and related noise from traffic and operation of the facilities. The effects would be more pronounced if the operating seasons for both the Many Glacier facilities and Swiftcurrent facilities were extended, since they are in the same valley. The effects would be negative, minor and long-term.
- **Alternative C.** Impacts for alternative B remain the same for this alternative.

Conclusion. All alternatives would have minor adverse, short-term impacts from construction and maintenance. In addition, alternatives B and C would have minor negative, long-term effects from increased activity due to an extended operating season.

There would be no significant adverse impacts on natural sound 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of natural sound as a result of the implementation of any of the alternatives.

Cumulative Impacts

Existing noise from vehicle traffic and developed areas would continue to affect natural sound inside and outside of the park. Reasonably foreseeable future projects outside the park would have local effects on natural sound, but would not create a cumulative impact in combination with projects inside the park. Reasonably foreseeable future projects inside the park, including the Going-to-the-Sun Road rehabilitation, combined with the commercial services alternatives would result in minor to moderate short-term, negative impacts on natural sound from the additive impact of multiple, simultaneous noise sources.

AIR QUALITY

Methodology

Current air quality conditions were assessed through consultation with Glacier National Park staff and U.S. Environmental Protection Agency reports. Alternatives were evaluated based on current air quality and information gathered from other environmental assessment and environmental impact statement documents as well as current literature reviews.

Thresholds of impact are defined in Table 4.1.

- *Negligible*: Changes in air quality would not be measurable.
- *Minor*: Effects would result in a measurable change in air quality, although the changes would be small and the impacts would be localized.
- *Moderate*: Effects on air quality would be readily measurable and widespread.
- *Major*: Effects would be readily measurable on a regional scale, and air quality standards could be exceeded.
- *Short-term*: Would occur during implementation.
- *Long-term*: Would be continual or permanent.

Impacts Common to All Alternatives

Alternatives that involve construction, rehabilitation and maintenance would experience traffic and activity from truck and equipment that would increase dispersed dust and exhaust emissions during implementation. Adverse impacts



on air quality would be minor to negligible, short-term and localized. Dust abatement measures would be implemented to minimize air-borne particulates.

Impact Analysis For Necessary and Appropriate Services Alternatives

Granite Park Chalet, Public Showers and Developed Areas

- **Alternatives B (Preferred) and C.** A temporary increase in exhaust emissions and particulate dust from construction and maintenance work under alternatives B and C for Granite Park Chalet, alternative B for public showers and the alternatives for the developed area would result in a negligible short-term, localized, adverse impact on air quality.

Constructing new parking lots or expanding existing ones in the developed areas would not significantly increase the amount of vehicle emissions in any given developed area, and adverse impacts would be negligible. Constructing and operating new guest and employee facilities in the developed areas would not impact air quality because new facilities would generate negligible emissions.

Firewood Sales

- **Alternative A – Status Quo/No Action.** There would be no new effects or change in air quality from existing conditions.
- **Alternatives B (Preferred) and C.** The anticipated increase in availability and use could result in minor, short-term, adverse effects on air quality in the park from increased firewood use.

Boat Tours and Transportation (Boat Taxi)

- **Alternative A – Status Quo/No Action.** Under alternative A, because tour boats generate negligible air pollutants, their emissions would continue to have negligible adverse impacts on air quality.
- **Alternative B (Preferred).** Added tour boat services on Lake McDonald and Two Medicine Lake would not dramatically increase emissions under alternative B, which would have negligible adverse impacts.

Guided Interpretive Motor Vehicle Tours and Public Transportation

- **Alternative A – Status Quo/No Action.** Assuming that motor vehicle tours, shuttle services and taxi services reduce the overall number of vehicles on park roads, continuing them under alternative A would continue to have a minor positive impact on air quality from reduced vehicle emissions.
- **Alternative B (Preferred).** Because expanding these services and providing shuttle services to transport private vehicles under alternative B would have a negligible influence on the number of vehicles currently on park roads, impacts would also be minor and positive.

Horseback Riding and Horse Packing Services

- **Alternatives A – Status Quo/No Action (Preferred), C and D** would have no impact on air quality.

- **Alternative B.** Under alternative B, no new facilities for expanded horseback riding or horse packing services in the Two Medicine and St. Mary areas would be built inside the park. All stock would be maintained outside the park from where they would be transported each day that services would be provided. This stock transport would negligibly increase in emissions from vehicles and would cause negligible adverse impacts on air quality.

Conclusion

Alternatives B and C for Granite Park Chalet, alternative B for public showers and alternatives for the developed areas would result in a negligible short-term, localized, adverse impact due to a temporary increase in exhaust emissions and particulate dust during construction.

Because constructing new parking lots in the developed areas would not significantly increase the amount of vehicle emissions in any given developed area, long-term adverse impacts on air quality would be negligible. Constructing and operating new guest and employee facilities in the developed areas would not impact air quality.

Under alternative A, emissions from tour boats would continue to have negligible long-term, localized, adverse impacts on air quality. These impacts would be the same under alternative B.

Assuming that guided motor vehicle tours and public transportation reduce the overall number of vehicles on park roads, alternatives A and B for these services would have minor long-term, widespread, positive impacts on air quality from reduced vehicle emissions.

Under alternative B for guided horseback riding and horse packing services, transporting stock to and from the park would result in a negligible long-term, localized, adverse impact on air quality. Alternatives A, C and D would not impact air quality.

There would be no significant adverse impacts on air quality whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of air quality as a result of the implementation of any of the alternatives.

Cumulative Impacts

Potential impacts from any alternatives combined with: dust generation and exhaust emissions from road and bridge improvement, and construction projects outside the park; Going-to-the-Sun Road rehabilitation work; and facility improvements or construction inside the park would have a negligible short-term, adverse impact on regional air quality. No long-term cumulative impacts would be expected as a result of implementing any of the alternatives combined with other projects outside the park; however, fueling the red buses with propane would have a minor long-term, positive cumulative impact on air quality inside the park. No cumulative impacts would exceed applicable regional air quality standards.

CULTURAL RESOURCES HISTORIC, ARCHAEOLOGICAL AND ETHNOGRAPHIC

Methodology

In this *Draft CSP and Draft EIS*, impacts on cultural resources are described below in terms of type, context, duration and intensity, which are consistent with the regulations of the Council on Environmental Quality (CEQ) that implement the National Environmental Policy Act (NEPA). These impact analyses are not intended to entirely fulfill the requirements of Section 106 of the National Historic Preservation Act (NHPA). A Section 106 review would occur before any undertaking is implemented.

Under the Advisory Council on Historic Preservation's regulations implementing Section 106 of the NHPA (36 CFR Part 800), findings of either *no adverse effect* or *adverse effect* must also be made for undertakings affecting National Register of Historic Places listed or eligible cultural resources. An *adverse effect* occurs when an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the national register (e.g. diminishes the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association). Adverse effects also include reasonably foreseeable effects caused by the preferred alternative that would occur later in time, be farther removed in distance or be cumulative (36 CFR Part 800.5, Assessment of Adverse Effects). A determination of *no adverse effect* means there is an effect, but it would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the national register.

The regulations of the Advisory Council on Historic Preservation specify documentation standards to enable reviewers to understand the basis for findings of effect. There is more detail in these standards than in this EIS. For example, the effect of a rehabilitation project on a historic building cannot be evaluated until construction documents are available. The park will comply with the procedures outlined in 36 CFR Part 800 during the project planning phases.

CEQ regulations and the National Park Service's Conservation Planning, Environmental Impact Analysis and Decision-Making (Director's Order #12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact (e.g., reducing the intensity of an impact from major to moderate or minor). Any resulting reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by Section 106 is similarly reduced.

Thresholds of impact for the purposes of this *Draft CSP and Draft EIS* are defined in Table 4.1.

Archaeological and Ethnographic Resources

- *Negligible*: Impact would be at the lowest level of detection — barely measurable with no perceptible consequences. For purposes of Section 106, the determination of effect would be *no adverse effect*.
- *Minor*: Disturbance of a site(s) would be confined to a small area with little, if any, loss of important information potential. For purposes of Section 106, the determination of effect would be *no adverse effect*.



- *Moderate:* Disturbance of the site(s) would not result in a substantial loss of important information potential. For purposes of Section 106, the determination of effect would be *no adverse effect* or *adverse effect*.
- *Major:* Disturbance of the site(s) would be substantial and would result in the loss of most or all of the site and its potential to yield important information. For purposes of Section 106, the determination of effect would be an *adverse effect*.
- *Short-term:* Would occur only during implementation.
- *Long-term:* Would be continual or permanent.

Historic Resources

- *Negligible:* Impact(s) would be at the lowest level of detection — barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be *no adverse effect*.
- *Minor:* Impact would alter a character defining feature(s) of a historic resource, but the work would be in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. For purposes of Section 106, the determination of effect would be *no adverse effect*.
- *Moderate:* Impact would alter a character defining feature(s) of the historic resource, diminishing the integrity of the resource, but still maintaining its eligibility for the national register. For purposes of Section 106, the determination of effect would be *adverse effect*.
- *Major:* Impact would alter a character defining feature(s) of a national historic landmark, diminishing the integrity of the resource to the extent that its designation is threatened. For purposes of Section 106, the determination of effect would be *adverse effect*.
- *Short-term:* Would occur only during implementation
- *Long-term:* Would be permanent

Impacts Common to All Alternatives

One of the purposes of the commercial services plan is to guide the general rehabilitation of historic concession facilities in the park. Consequently, rehabilitation of historic concession facilities under any of the alternatives would inevitably impact historic resources. Exact impacts on historic resources would depend on specific site and facility design plans, which would be developed in accordance with Section 106, the Secretary's Standards, and in consultation with the Montana State Historic Preservation Officer.

Both short-term and long-term impacts on historic resources would occur. Short-term impacts would include temporary changes to the historic setting of a historic district or to a historic building due to the presence of construction equipment and materials, or actual temporary changes to buildings during rehabilitation work. Such short-term impacts would be minor to moderate and adverse. Long-term impacts could be both positive and negative. Moderate to major long-term, positive impacts on historic

resources would result from the rehabilitation of deteriorating historic facilities. Long-term adverse impacts would only occur when no practical alternative is available. Potential long-term, adverse impacts would depend on specific design, but could include the introduction of non-historic materials into a facility, changing the historic design of a facility, altering the size, scale, or placement of a historic feature, or replacing a historic feature with a modern structure. Specific long-term, adverse impacts on historic buildings are not discussed in this EIS because none are anticipated (with the potential exception of the Lake McDonald Coffee Shop). The park intends to follow *The Secretary of the Interior's Standards for the Treatment of Historic Properties* when planning specific projects affecting historic properties.

Archaeological surveys have been conducted within and around the developed areas. Although a few sites have been found within the developed areas, no known sites would be affected by any of the alternatives. All new ground-disturbing activities would be monitored by an archaeologist, and if archaeological material is located, work would be stopped immediately at the affected area, and Section 106 procedures would be implemented.

The alternatives would not likely affect ethnographic resources in the park. The Blackfoot and the Confederated Salish and Kootenai Tribes have not raised concerns over projects in the park's developed areas in the past. Likewise, the tribes have not raised concerns over other services and guided activities that would occur throughout the park. However, Glacier National Park recognizes that the tribes hold a body of knowledge that may result in the identification of ethnographic resources in developed or other park areas in the future. The tribes have been notified of this project through the scoping process and Glacier National Park will invite comments on this EIS. Further consultation will occur in accordance with federal legislation and regulations and National Park Service policy, if ethnographic resources are identified in the future.

Impact Analysis For Necessary and Appropriate Services Alternatives

Granite Park Chalet

- **Alternative A – Status Quo/No Action.** This alternative would maintain current conditions at Granite Park Chalet, and there would be no new impacts on the Granite Park Chalet and Dormitory National Historic Landmark or historic district.
- **Alternatives B (Preferred) and C.** Construction activities under alternatives B and C would have minor short-term, adverse impacts on the historic resources.
- **Conclusion.** Alternative A would have no impact. Alternatives B and C would have minor short-term, adverse impacts on historic resources during construction.

There would be no significant adverse impacts on historic resources 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of historic resources as a result of the implementation of any of the alternatives.

Apgar Village Developed Area

No buildings or structures in the Apgar Village developed area are listed in the National Register of Historic Places. The Apgar Village School House, a privately owned gift store, and the Permit Office may be eligible for the national register; however, these buildings would not be affected by any of the alternatives.

Lake McDonald Developed Area

- **Alternative A – Status Quo/No Action.** Upgrading the historic buildings in the Lake McDonald developed area to comply with life safety, accessibility, and building codes would have both positive and negative impacts from rehabilitation of historic resources as described above for all alternatives.
- **Alternative B.** Impacts described for alternative A also apply to this alternative.

In addition, the Going-to-the-Sun Road National Historic Landmark and the Lake McDonald Lodge Historic District meet where the main entrance road intersects the Going-to-the-Sun Road. Modifying the main entrance road and reconfiguring parking on the promenade would have short-term adverse impacts on the historic district and national landmark during construction; however, long-term impacts would depend on final project design.

Constructing new parking lots in Areas I and II, a new laundry and maintenance facility in Area I, and a new employee housing village in Area II would add new development to the historic district. The new employee housing village would be designed to be architecturally compatible with the historic district. Long-term impacts on historic resources could be moderate to major and adverse.

Converting historic buildings from employee facilities to guest accommodations would be undertaken with minimal changes to the buildings' defining characteristics. This action should have no significant long-term, adverse impact on historic resources.

Impacts on historic resources from modifying the exterior of the Coffee Shop are unknown at this time. The park must prepare a Determination of Eligibility to determine if the Coffee Shop is eligible for the National Register of Historic Places. If it is determined to be eligible, this action would have a moderate, adverse impact on the Lake McDonald Lodge Historic District.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B also apply to this alternative with the following exceptions.

If the Coffee Shop were determined eligible for the national register (as described above), demolishing it would have a moderate, adverse impact on the Lake McDonald Lodge Historic District.

- **Conclusion.** Alternatives A, B and C would all have moderate to major long-term, site-specific positive impacts from rehabilitating deteriorating historic resources. Alternatives B and C could also have moderate long-term, site-specific, adverse impacts from adding new development to the Lake McDonald Lodge Historic District. Specific long-term impacts would depend on final project design plans.

There would be no significant adverse impacts on historic resources 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of historic resources as a result of the implementation of any of the alternatives.

Rising Sun Developed Area

- **Alternative A – Status Quo/No Action.** Upgrading the historic buildings in the Rising Sun developed area to comply with life safety, accessibility, and building codes would have both positive and negative impacts from rehabilitation of historic resources as described under impacts common to all alternatives.
- **Alternative B.** Impacts described for alternative A also apply to this alternative.

Additionally, constructing new guest cabins on the Upper Loop would add new buildings to the Rising Sun Historic District; however, the new cabins would be designed to closely match the historic cabin design and fill in areas where cabins once existed. This action should have no significant long-term, adverse impact on historic resources.

The construction of a new employee dormitory with parking and an outdoor recreation facility near the Lower Motel would occur outside of the historic district and should have no significant adverse impact on historic resources.

Rehabilitation of the General Store/Motel/Dormitory and Coffee Shop building would be undertaken with minimal changes to the building's defining characteristics. This should have no significant long-term, adverse impact on historic resources.

- **Alternative C (Preferred).** Impacts from alternative A also apply to this alternative. Although alternative C would construct more new guest cabins and an additional employee dormitory than would alternative B, impacts on historic resources would generally be the same for alternatives B and C. In addition, the rehabilitation of some historic buildings for new functions under alternative C would be designed with minimal changes to the buildings' defining characteristics, and no significant long-term, adverse impacts on historic resources would be expected.
- **Conclusion.** Alternatives A, B and C would all have negligible to minor, long-term, site-specific positive impacts from rehabilitating deteriorating historic resources. Specific long-term impacts would depend on final project design plans.

There would be no significant adverse impacts on historic resources 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of historic resources as a result of the implementation of any of the alternatives.

Two Medicine Developed Area

- **Alternative A – Status Quo/No Action.** Upgrading the historic buildings in the Two Medicine developed area to comply with life safety, accessibility, and building codes would have both positive and negative impacts from rehabilitating historic resources as described under impacts common to all alternatives. Modifying the existing comfort station to be compatible with the

area's historic architectural character would have a minor long-term, positive impact on historic resources.

- **Alternative B (Preferred).** This alternative would also have both positive and negative impacts from upgrading historic buildings to comply with life safety, accessibility, and building codes as described above for all alternatives. In addition, this alternative would have moderate positive impacts on historic resources. Removing the existing comfort station and constructing a new one that is compatible with the area's historic architectural character, as well as restoring the historic character of the General Store exterior and landscape would have minor long-term, positive impacts on historic resources.
- **Conclusion.** Alternatives A and B would have an overall minor, long-term, positive, site-specific impact on historic resources.

There would be no significant adverse impacts on historic resources 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of historic resources as a result of the implementation of any of the alternatives.

Many Glacier Developed Area

- **Alternative A – Status Quo/No Action.** Upgrading the historic buildings in the Many Glacier developed area to comply with life safety, accessibility, and building codes would have both positive and negative impacts from rehabilitation of historic resources as described above for all alternatives.
- **Alternative B.** Impacts described for alternative A also apply to this alternative.

In addition, restoring the designed historic landscape of the area surrounding the hotel, based on a Cultural Landscape Report, would result in a minor long-term, positive impact on the historic district. Because historic use of the area between Many Glacier Hotel and Swiftcurrent Lake has not been documented, it is unknown how the area was used and developed. Due to lack of information, it cannot be determined at this time what the impacts would be on the historic landscape and use of this area.

Impacts from developing a trail around Swiftcurrent Lake are unknown at this time. The park must prepare a Determination of Eligibility to determine if the trail is eligible for the National Register of Historic Places. If it is determined eligible, this action would have a negligible to minor, adverse impact on historic resources, depending on actual project design.

Reconstructing the stairway and additional historic features in the Many Glacier Hotel lobby would have a minor long-term, positive impact on historic resources.

- **Alternative C (Preferred).** Applicable impacts described for alternatives A and B also apply to this alternative with the following additions.

Constructing a new dormitory and outdoor recreational facility near the Upper Dormitory in Area II would add new development to the Many Glacier Hotel Historic District. The new dormitory

would be constructed at the edge of the historic district and would be designed to be architecturally compatible with it; however, long-term, adverse impacts on historic resources could be minor.

The conversion of the Lower Dormitory to guest lodging would be designed with minimal changes to the building's defining characteristics. This action should have a minor long-term, adverse impact on historic resources.

- **Conclusion.** Alternatives A, B and C would all have negligible to minor long-term, site-specific positive impacts from improving historic resources. In addition, alternative C could also have minor long-term, site-specific, adverse impacts from adding new development to the Many Glacier Hotel Historic District. Specific long-term impacts would depend on final project design plans.

There would be no significant adverse impacts on historic resources 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan (NPS 1999) or other relevant National Park Service planning documents. Consequently, there would be no impairment of historic resources as a result of the implementation of any of the alternatives.

Swiftcurrent Developed Area

- **Alternative A – Status Quo/No Action.** Upgrading the historic buildings in the Swiftcurrent developed area to comply with life safety, accessibility, and building codes would have both positive and negative impacts from rehabilitating historic resources as described above for all alternatives.
- **Alternative B (Preferred).** Impacts described for alternative A also apply to this alternative.

Removing cabin parking from the cabin rings and relocating parking along the loop road would alter the historic district somewhat, resulting in potential negligible to minor, positive impacts on historic resources.

Filling in the existing cabin rings with new guest cabins would result in no significant adverse impacts on the historic district. The new cabins would be designed to closely match the historic cabin design and fill in areas where cabins were once located. Constructing new cabin rings outside of, but adjacent to the historic district on the former Motel 4 site should have no adverse impact on historic resources. In addition, constructing a fourth motel in Area I should not impact historic resources because it is outside of the historic district.

- **Alternative C.** Applicable impacts described for alternatives A and B also apply to this alternative, with the following exception. Constructing a new employee dormitory in Area II outside of the historic district should not adversely impact historic resources.
- **Conclusion.** Alternatives A, B and C would all have negligible to minor, long-term, site-specific positive impacts from improving historic resources. In addition, some alterations to the historic district under alternatives B and C could have negligible to minor, long-term, site-specific, adverse impacts.

There would be no significant adverse impacts on historic resources 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 to opportunities for enjoyment of the park; or 3) identified as a goal in the park's General Management Plan or other relevant National Park Service planning documents. Consequently, there would be no impairment of historic resources as a result of the implementation of any of the alternatives.

Cumulative Impacts

The Going-to-the-Sun rehabilitation project combined with the alternatives in the commercial services plan would have a moderate short-term, widespread, adverse cumulative impact on historic resources during construction, but a moderate to major widespread, positive cumulative impact on historic resources over the long term due to improvements of deteriorating historic buildings and structures. No cumulative impacts are anticipated for archaeological or ethnographic resources.

VISUAL RESOURCES

Methodology

Scenic/visual resources in the park were assessed through field visits and consultation with Glacier National Park staff. Alternatives were evaluated based on current views and information gathered from other environmental assessments and environmental impact statements.

Thresholds of impact are defined in Table 4.1.

- *Negligible:* Effects would not result in any perceptible changes to existing viewsheds.
- *Minor:* Effects would result in slightly detectable changes to a viewshed in a small area or would introduce a compatible human-made feature to an existing developed area.
- *Moderate:* Effects would be readily apparent and would change the character of visual resources in an area.
- *Major:* Effects would be highly noticeable or would change the character of visual resources by adding human-made features into a mostly undeveloped area or by removing most human-made features from a developed area.
- *Short-term:* Would be temporary during implementation
- *Long-term:* Would be permanent or continual

Impacts Common to All Alternatives

The presence of maintenance and construction equipment for all alternatives involving construction and/or repair would result in minor short-term, site-specific, adverse impacts on visual resources.



Impact Analysis For Necessary and Appropriate Services Alternatives

Granite Park Chalet, Public Showers and Boat Tours

- **Alternatives B (Preferred)** and **C** for Granite Park Chalet and **alternative B (Preferred)** for public showers would have minor short-term, adverse impacts due to the presence of construction equipment in the Granite Park Chalet area and the Apgar, Rising Sun, Two Medicine and Many Glacier campground areas during construction. Long-term adverse impacts in these areas would be negligible because new facilities would be placed in existing developed areas and would not result in any perceptible changes to visual resources. The extension of the dock would result in a minor long-term, adverse impact on visual resources.

Conclusion

Constructing new facilities under alternatives B and C for Granite Park Chalet and under alternative B under public showers would have overall negligible, long-term, site-specific, adverse impacts because new facilities would be placed in existing developed areas.

There would be no significant adverse impacts on visual resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the General Management Plan (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of visual resources as a result of the implementation of any of the alternatives.

Impacts Common to All Alternatives in the Developed Areas

The presence of construction equipment in the Apgar Village, Lake McDonald, Rising Sun, Two Medicine, Many Glacier and Swiftcurrent developed areas during construction and maintenance under any of the alternatives would have short-term minor, adverse impacts on visual resources. Constructing new guest and employee facilities or parking lots in any of the developed areas under any of the alternatives would result in minor to moderate changes to existing visual quality because the areas are already developed and contain existing human-made structures. All new facilities would be within existing developed areas and architecturally compatible with existing facilities there. Depending on the size and location of new construction, adverse impacts in developed areas would be moderate to minor, long-term, and site-specific.

Apgar Village Developed Area

- **Alternative B (Preferred).** Constructing a new, smaller turnaround at the terminus of the Apgar Loop Road, creating a pedestrian green space in Area I along the lakeshore, and constructing new parking lots in Areas I and II to replace parking along Apgar Loop Road would divert traffic away from the lakeshore and open up the viewshed of Lake McDonald from the road. Visual resources would be improved from Apgar Village, and positive impacts would be moderate.
- **Alternative C.** Impacts described for alternative B also apply to this alternative. In addition, removing the Village Inn and converting the site to a pedestrian green space would open up the viewshed across Lake McDonald, resulting in a major positive impact.
- **Conclusion.** Alternative A for the Apgar Village developed area would have only minor short-term, site-specific, adverse impacts from the presence of maintenance and construction equipment.

Alternative B would have moderate long-term, positive, site-specific impacts, while alternative C would have overall long-term, major, positive, site-specific impacts from improving the viewshed of Lake McDonald.

Lake McDonald Developed Area

- **Alternative B.** Modifying the exterior of the Coffee Shop to make it more compatible with the historic district would result in a moderate positive impact on the visual quality of the Lake McDonald Lodge Historic District.
- **Alternative C (Preferred).** Demolishing the Coffee Shop and constructing a new restaurant would result in a major positive impact on the visual quality of the Lake McDonald Lodge Historic District because the new restaurant would be designed to complement the historic district, and its orientation would allow the historic green space north of the boulevard to be emphasized.
- **Conclusion.** Under alternative A for the Lake McDonald developed area, the presence of maintenance and construction equipment would cause only minor short-term, site-specific adverse impacts. Alternatives B and C would have both positive and negative impacts on visual resources: constructing facilities and parking lots would add new human-made features to the developed area, resulting in moderate long-term, site-specific, adverse impacts for both alternatives. However, alternative B would improve the visual quality of the historic district by modifying the exterior of the Coffee Shop, having moderate long-term, positive, site-specific impacts; constructing a new Coffee Shop under alternative C would have major long-term, positive, site-specific impacts.

Rising Sun Developed Area

- **Conclusion.** Alternative A for Rising Sun would have minor short-term, site-specific, adverse impacts only during construction and maintenance activities. Alternatives B and C (Preferred) would construct new facilities in the developed area, resulting in overall moderate, long-term, site-specific, adverse impacts.

Two Medicine Developed Area

- **Alternative B (Preferred).** Removing some of the parking from the lakefront would improve the viewshed of Two Medicine Lake, resulting in a moderate positive impact.

Removing the existing comfort station and constructing a new one at a new location in Area I, as well as restoring historic landscape features in front of the General Store, which is a National Historic Landmark, would improve its visual quality. The impacts on visual resources would be moderate and positive.

- **Conclusion.** Alternative A for Two Medicine would have negligible to minor short-term, site-specific, adverse impacts during construction and maintenance activities. Alternative B would improve the viewshed of Two Medicine Lake and the visual quality of the General Store National Historic Landmark. These actions would have a moderate long-term, positive, site-specific impact.

Many Glacier Developed Area

- **Alternatives B and C (Preferred).** Screening service structures and yards along the approach road in Area I and improving the landscape of the Many Glacier Hotel site with native trees, shrubs and wildflowers would improve the visual quality of the developed area. These actions would have a moderate positive impact.

- **Conclusion.** Under Alternative A for the Many Glacier developed area, the presence of maintenance and construction equipment would only cause minor short-term, site-specific adverse impacts. Alternatives B and C would have both positive and negative impacts. Under alternative B, constructing a new employee recreation facility at the edge of the developed area would cause minor long-term, site-specific, adverse impacts, while constructing a new employee housing and recreation facility under alternative C would cause moderate long-term, site-specific, adverse impacts. However, improving the cultural landscape of the area would have moderate long-term, positive, site-specific impacts on visual resources.

Swiftcurrent Developed Area

- **Conclusion.** Alternative A for the Swiftcurrent developed area would have minor short-term, site-specific, adverse impacts during construction and maintenance activities. Alternatives B and C would have overall moderate, long-term, site-specific, adverse impacts on visual resources from the construction of new guest and visitor facilities and parking in the developed area.

Cumulative Impacts

All of the impacts on visual resources from the alternatives discussed in the commercial services plan would be either short-term, or long-term but site-specific. There would not be any cumulative impacts on visual resources caused by projects outside of the park. Other reasonably foreseeable future projects inside the park, including the Going-to-the-Sun Road rehabilitation, and small-scale maintenance and construction projects throughout the park would have an overall minor, adverse cumulative impact on visual resources in the park.

REGIONAL AND LOCAL COMMUNITIES

Methodology

Local and regional communities are situated in the area defined as the three-county region of Flathead, Glacier and Lake Counties. Impacts on these local and regional communities were assessed using both qualitative and quantitative analyses of the alternatives. The analyses were made with respect to construction spending; employment during construction and on-going operation and maintenance; visitor spending; the addition of guest accommodations and employee housing; the extension of the operating season; and impacts of various concession operation enhancements.

Information was obtained through consultation with professional economists, park staff, the architectural and planning consultant for the Commercial Services Plan, and research of State of Montana and national studies. Specific methods for evaluating topical areas were used as appropriate and are described in the following discussion.



Thresholds of impact are defined in Table 4.1.

- *Negligible:* Effects would be below or at the level of detection. The effect would be slight.
- *Minor:* Effects would be detectable, but would be slight.

- *Moderate:* Effects would be readily apparent.
- *Major:* Effects would be readily apparent and would cause substantial changes to socioeconomic conditions in the region.
- *Short-term:* Would occur only during implementation (varies by site to a maximum of 10 years).
- *Long-term:* Would be continued beyond the duration of construction or would be permanent.

In comparison with other impact topics, socioeconomic impacts involve economic, employment and social concerns that affect not only individual sites within Glacier National Park, but also the surrounding local and regional areas. In particular, money spent and employment generated affect the general regional and local economy and should be examined on a larger scale as well as by each of the developed areas. For this reason, each impact was evaluated at the local and regional level for each alternative as well as for the combined set of actions.

Impacts Common to All Alternatives

Construction Spending and Employment

Construction spending consists of expenditures for design services, construction management, and labor and materials. Prior experiences with National Park Service facilities projects in Glacier National Park and Mesa Verde National Park were evaluated in order to estimate generalized project cost breakouts. Cost breakouts vary by project, depending on such factors as proximity to and availability of a construction employment force and materials, prevailing wages, building standards, delays and seasonal constraints. For the purpose of this study, it is assumed that project costs are divided as follows: architectural/engineering and construction management services (25%), labor (45%) and materials (35%). Project cost breakouts will be refined through more detailed cost estimating to be prepared later in the design process, and may differ from breakouts presented here.

Under alternatives for the six developed areas, construction funds would be spent on various components of design and construction in the three-county area, elsewhere in the state and out of the state. Based on the Many Glacier Hotel Stabilization Project, an ongoing project comparable to work proposed in the Commercial Services Plan, assumptions were made about the employment and funds spent in the local and regional economy compared to total employment and spending (pers. com. from Jason Casperson, DPS, to ARC, Oct. and Nov. 2002.) It is assumed that approximately 20% of the architectural/engineering and construction management services would be local and 80% would be out-of-state. Half of the construction workers would be local, while half would come from out-of-state. Out-of-state employees would spend 10% of their wages per diem in the area. It is assumed that nearly all construction firms and workers would come from the United States; consequently, Alberta or British Columbia, Canada would not be impacted. Virtually all of the materials would come through local and state vendors. An estimated 15% of the value of goods would be captured in the local and regional communities, including wages, overhead and profit, while the remaining 85% would be expected to pay for the materials imported from outside the region.

The following table summarizes the anticipated economic impacts of the investments by alternative.

TABLE 4-3 ESTIMATED PROJECT COSTS AND CONSTRUCTION-BASED LOCAL AND REGIONAL SPENDING BY ALTERNATIVE

Locations	Alternative	Estimated Investment	Estimated Funds Spent in Local and Regional Communities
Necessary & Appropriate Services			
Granite Park Chalet			
	Alternative A	\$ -	\$ -
	Alternative B	\$ 1,650,000	\$ 374,000
	Alternative C	\$ 2,380,000	\$ 539,000
Public Showers (various locations)			
	Alternative A	\$ -	
	Alternative B	\$ 900,000	\$ 204,000
Developed Areas			
Apgar			
	Alternative A	\$ 481,000	\$ 109,000
	Alternative B	\$ 1,995,000	\$ 452,000
	Alternative C	\$ 7,082,000	\$ 1,603,000
Lake McDonald			
	Alternative A	\$ 6,372,000	\$ 1,443,000
	Alternative B	\$ 14,870,000	\$ 3,365,000
	Alternative C	\$ 28,595,000	\$ 6,470,000
Rising Sun			
	Alternative A	\$ 3,998,000	\$ 905,000
	Alternative B	\$ 7,233,000	\$ 1,637,000
	Alternative C	\$ 10,345,000	\$ 2,340,000
Two Medicine			
	Alternative A	\$ 858,000	\$ 194,000
	Alternative B	\$ 1,419,000	\$ 321,000
Many Glacier			
	Alternative A	\$ 24,194,000	\$ 5,474,000
	Alternative B	\$ 27,624,000	\$ 6,250,000
	Alternative C	\$ 37,037,000	\$ 8,380,000
Swiftcurrent			
	Alternative A	\$ 2,684,000	\$ 607,000
	Alternative B	\$ 9,521,000	\$ 2,154,000
	Alternative C	\$ 9,369,000	\$ 2,120,000

For purposes of this analysis, it is assumed that the Commercial Services Plan improvements could be implemented over a ten-year period of time. In the first three years, a higher level of construction-based activity is assumed to occur, during which 56% of total project funds would be expended. During the next seven years, the level of activity would taper off to completion of the plan. The schedule is assumed to be the same under all alternatives. It must be noted that this hypothetical schedule is subject to funding availability. Numerous variables could extend the time frame beyond ten years and lead to different sequences of high and low-activity years.

Investments that generate jobs provide a positive contribution to the regional and local economies. The relative significance of the contribution of construction-based spending to the local and regional communities can be approximately measured by comparing annual funds spent in the local and regional economies to the total annual wages in the three-county region. Total construction wages for general building in the three-county region were estimated at \$21.8 million in 2001 (Montana Dept. of Labor & Industry 2001a, 2001b, and 2002). The estimated contribution to the regional general building construction wages by the Commercial Services Plan alternatives would be between 4.1% to 10.0% per year during the highest three years over ten years of construction activities. In relation to the overall economy of Flathead, Glacier and Lake Counties, the capital investments for the plan would be fairly small. In 2001, the most recent year for which data is available, the annual wages paid for all industries in the three-county region exceeded \$1 billion (Montana Dept. of Labor & Industry 2001a, 2001b, and 2002). The range of total local spending for the plan is estimated to be between \$8.73 million and \$22.01 million over the construction period, and between \$896,000 and \$2,184,629 per year during the highest three years of construction activities. Construction-based spending for improvements described in the Commercial Services Plan would increase the three counties' total annual wages by between 0.08% to 0.20% during the three peak years of construction activities. Table 4-4 below shows the total wages paid in year 2001 in the region by county. Table 4-5 shows the estimated construction-based spending in local and regional communities in comparison to the three-county region's annual wages.

TABLE 4-4 TOTAL WAGES PAID IN LOCAL AND REGIONAL COMMUNITIES

	Annual Wages Paid 2001 for General Building Construction	Annual Wages Paid - 2001 for All Industries
Glacier	\$ 1,185,802	\$ 88,613,531
Lake	\$ 3,060,944	\$ 181,188,961
Flathead	\$ 17,567,111	\$ 811,970,021
Total	\$ 21,813,857	\$ 1,081,772,513

TABLE 4-5 ESTIMATED TOTAL LOCAL AND REGIONAL IMPACTS FROM CONSTRUCTION-BASED SPENDING

	Total Local & Regional Spending	Total Local & Regional Construction Wages	High Year Annual Local and Regional Construction Wages	Portion of Total Local & Regional Spending to Regional Total Wages - High Years	Portion of Local & Regional Construction Wages to Regional General Building Wages - High Years
Alternative A - Status Quo (Least Costly)	\$8,732,000	\$4,775,000	\$896,802	0.08%	4.11%
Preferred Alternatives	\$20,695,000	\$11,002,500	\$2,066,401	0.19%	9.47%
Combination of Most Costly Alternatives	\$22,011,000	\$11,632,000	\$2,184,629	0.20%	10.01%

Direct and Indirect Spending

Per capita retail sales vary considerably across counties, since residents of small communities often cross county lines to shop in larger towns and cities. It is estimated that “completely rural counties” in Montana – including Lake and Glacier Counties – capture 60% of their residents’ retail expenditures, indicating that 40% of their retail expenditures are spent outside the county of residence. On the other hand, “urbanized nonmetro counties” having at least 10,000 people living in urban places – including Flathead County – attract per capita sales estimated to be 15% greater than expenditures by their residents (U.S. Department of Agriculture 2000).

The indirect benefit — sometimes called the “multiplier effect” — of spending construction dollars in the local and regional economies for design, labor and materials consists of the recirculation of “new money” exported from outside the local and regional economies. The multiplier of direct to indirect spending depends on characteristics of the local and regional economies regarding the level of local “leakage” in buying goods and services supplied from outside the local and regional area (Ellard et al). The indirect benefits would likely contribute to the local and regional economies from 118% to 140% of the direct spending, based on the methodology used in the *Draft Going-to-the-Sun Rehabilitation Plan/Environmental Impact Statement* (NPS 2002). The indirect benefits accrued from the Commercial Services Plan construction activities would vary by county since smaller rural counties capture fewer retail expenditures than larger, more urban counties.

Visitation and Visitor Spending

The total number of visitors to Glacier National Park is projected to increase at a slow rate, amounting to approximately 2% total over a ten-year period and an average of 0.23% per year, as shown in Chapter 3 Affected Environment. Additionally, the increase in guest accommodations also would be minor.

Visitor spending would not increase measurably for any of the alternatives, although it is likely that park visitors and hotel guests would spend more money for commercial services due to enhancements to the developed areas and the modest increase in accommodations. Increased prices for lodging, food or any other services could result in some additional spending.

It should also be noted that lack of investment in commercial services facilities and allowing the facilities to substantially degrade would result in minor to moderate, negative impacts on visitation and visitor spending. Commercial services facilities improvements would avert a decline in visitation and visitor spending that could result from neglect or lower service levels.

Concessioner operations could be impacted during construction and rehabilitation, potentially causing a short-term decline in visitation and visitor spending. If construction occurs during the visitor season, impacts on concessioner operations could be minor to moderate, adverse and short-term. If construction occurs during the off-season, concessioner operations would not be impacted. The construction and rehabilitation of guest units and conversion of employee housing to guest units would be coordinated to minimize the loss of guest rooms at any one time, eliminating short-term impacts on concessioner operations. However, construction and rehabilitation could cause an overall loss of guest rooms during any single visitor season, resulting in minor to moderate, negative, but short-term impacts on concessioner operations. Depending on location, if these impacts occur, a negligible to minor, short-term decrease in visitor spending could also occur.

Addition of Guest Accommodations

The total number of guest rooms available in the park would not increase substantially under the alternatives, growing from 512 to a target maximum of 540 rooms. The impacts on accommodations vary by alternative. During the highest visitation period of the tourist season, when there are no lodging vacancies, the addition of 28 guest rooms would likely add to the total number of guests staying in the park. During periods when lodging occupancy is low, additional capacity might not result in additional overnight stays in the park. Table 4-6 below shows the number of guest rooms by alternatives.

TABLE 4-6 GUEST ACCOMMODATIONS (ROOMS)

Facility Area	Existing/ Alternative A	Alternative B	Alternative C	Preferred Alternatives
Apgar	36	Approx. 36	Approx. 36	Approx. 36
Lake McDonald	100	Approx. 90 - 100	Approx. 110 – 120	Approx. 110 – 120
Rising Sun	72	Approx. 75 – 80	Approx. 75 – 80	Approx. 75 – 80
Two Medicine	0	0	0	0
Many Glacier	216	Approx. 210 - 220	Approx. 230 – 240	Approx. 230 – 240
Swiftcurrent	88	Approx. 75 – 80	Approx. 85 - 95	Approx. 75 – 80
Total	512	486 - 516	536 - 571 ¹	540 ¹
Net Change from Existing	No Change	26 Fewer to 4 Additional Rooms	24 to 28 Additional Rooms	14 to 28 Additional Rooms ¹

¹ The National Park Service has set a park-wide maximum of 540 guest rooms, not including the backcountry chalets and private lodging. Consequently, the net change under the preferred alternative is limited to no more than 28 additional rooms. See Appendix 4, Comparative Site Alternatives Analysis Supplemental Information.

A 4% State Lodging Facility Use Tax, commonly called the “bed tax,” is collected on all lodging accommodations. Additional bed tax revenues would result from occupancy of the added guest rooms and generate more advertising funding for local chambers of commerce and other regional non-profit tourism corporations. In turn, enhanced advertising would likely increase visitation to the area, having a negligible to minor, long-term positive impact on visitor spending in local and regional communities.

Addition of Employee Housing Accommodations

The impacts on employee housing accommodations vary by alternative, as shown in Table 4-7 below.

TABLE 4-7 EMPLOYEE HOUSING (BEDS)

Facility Area	Alternative A — Status Quo/No Action	Alternative B	Alternative C	Preferred Alternatives
Apgar ¹	Approx. 2	Approx. 2	Approx. 2	Approx. 2
Lake McDonald Area	Approx. 169	Approx. 166	Approx. 181	Approx. 181
Rising Sun	Approx. 61	Approx. 72	Approx. 85	Approx. 85
Two Medicine	Approx. 14	Approx. 14	Approx. 14	Approx. 14
Many Glacier	Approx. 223	Approx. 223	Approx. 243	Approx. 243 ²
Swiftcurrent	Approx. 55	Up to 120	Up to 118	Up to 120 ²
Granite Park Chalet	Approx. 2	Approx. 2	Approx. 8	Approx. 2
Sperry Chalet	Approx. 8	N/A	N/A	N/A
Total	Approx. 534	Approx. 599	Approx. 651	605 - 607
Net Change from Existing	No Change	Approx. 65	Approx. 117	Approx. 121

¹ Housing for approximately 8 horse concession employees is provided outside the Apgar Village at the stables.

² If Many Glacier employee housing were reduced to offset the gain of new employee housing at Swiftcurrent then the net gain would be smaller than the range presented.

See Appendix 4, Comparative Site Alternatives Analysis Supplemental Information.

Maintaining and enhancing the employee facilities would provide a greater number of beds and more desirable living arrangements for employees. This improvement would allow concessioners to retain a diverse, qualified staff, resulting in an overall minor, positive long-term impact. Currently, some employees live in nearby communities and must drive considerable distances. The current primary concessioner hires approximately 25 local employees who live outside the park, amounting to roughly 4% of their total work force in Glacier National Park. The substantial distance from employee pools has affected the concessioner's ability to recruit and retain sufficient locally hired employees at many of the developed areas in the past. Consequently, the expanded concessioner housing provided under the alternatives may further affect the concessioner's incentive to hire locally. However, given the limited number of employees affected and the park's policy of encouraging concessioners to recruit and hire from local communities (including Blackfeet and Confederated Salish and Kootenai Tribe members), the alternatives would have negligible, negative, short-term impacts on local and regional communities.

Extension of Operating Season

Extending the operating season of various lodge facilities and associated accommodations would allow visitors increased opportunities to stay in Glacier National Park and increase revenues and employment opportunities, resulting in minor increases in visitor and employee spending that would result in a positive, long-term benefit for the local and regional economies. In addition, the longer operating season would shorten the off-season when many of the maintenance and new construction activities occur, resulting in negligible negative, long-term impacts. The operating season of individual facilities might require temporary seasonal adjustments to avoid interfering with necessary maintenance and construction projects.

Impact Analysis for Necessary and Appropriate Services Alternatives

Expanding commercial services would increase employment opportunities, resulting in negligible to minor, positive long-term impacts on regional and local communities.

Alternatives that would develop new business opportunities include: private vehicle shuttle service, motorcycle tours, and guided underwater diving. Alternatives that would enhance existing services include: expanding boat tours and transportation on Lake McDonald and Two Medicine Lake, and expanding guided horseback riding in the Two Medicine and St. Mary areas. Providing firewood sales in campgrounds and additional public showers would increase revenue opportunities. These new business opportunities and enhanced services might increase visitation and visitor spending, resulting in negligible long-term, positive impacts on local and regional communities.

New interpretive services that would provide increased revenue opportunities include step-on guide services, guided underwater diving and guided motorcycle tours. Increased opportunities would also be provided by enhancing these existing services: guided interpretive vehicle tours, guided bicycle tours, natural history and cultural day hiking opportunities, and the proposed doubling of the current day hiking use level. Increases in opportunities for interpretive services would result in negligible to minor, positive, long-term impacts on local and regional economies.

Improvements to Granite Park Chalet and the development of additional public showers both entail construction activities resulting in positive, short-term impacts on regional and local communities. A total of \$374,000 would be spent locally and regionally on the construction of Granite Park Chalet improvements under alternative B, resulting a negligible positive, short-term impact. A total of \$539,000 would be spent locally and regionally on the construction of Granite Park Chalet

improvements under alternative C, resulting a negligible positive, short-term impact on regional or local communities. Similarly, \$204,000 would be spent locally and regionally on the construction of public showers improvements under alternative B, resulting a negligible positive, short-term impact on regional or local communities.

Conclusion

The alternatives for expanding commercial services would result in negligible to minor, positive long-term impacts on regional and local communities from increased revenue opportunities, associated employment, and increased visitation and visitor spending. Those alternatives that require construction activities (i.e., Granite Park Chalet and additional public showers) would also result in negligible positive, short-term impacts on regional and local communities from spending and employment generated.

Apgar Developed Area

- **Alternative A – Status Quo/No Action.** An estimated total of \$109,000 would be spent locally and regionally on improvements to the Apgar developed area and have a negligible positive, short-term impact on regional or local communities because the proposed spending level is relatively low.
- **Alternative B (Preferred).** A total of \$452,000 would be spent locally and regionally on the Apgar developed area, and would result in a negligible positive, short-term impact on regional or local communities because the proposed spending level is relatively low.

Extending the operation season of the Village Inn by eight weeks could result in negligible to minor, positive long-term benefits from increased revenue opportunities for all the concessioners, although it might increase shoulder season competition with businesses outside the park.

- **Alternative C.** A total of \$1,603,000 in spending locally and regionally would have a minor positive, short-term impact on regional or local communities because the proposed spending level is more substantial. Extending the operation season would have the same impacts as under alternative B.
- **Conclusion.** None of the alternatives would change the numbers of guest accommodations and employee housing capacity at the Apgar developed area; however, extending the season under alternatives A and B would have a positive, long-term impact from increased revenue opportunities. Construction-based investments would impact the regional and local communities because some of the investment amounts would be spent in the region. While the impacts from alternatives A and B on the local economy are negligible, impacts from the higher spending level in alternative C would have a minor, positive impact.

Lake McDonald Developed Area

- **Alternative A – Status Quo/No Action.** A total of \$1,443,000 would be spent locally and regionally on improvements to the Lake McDonald developed area, resulting in a minor positive, short-term impact on regional or local communities because the proposed spending level is relatively low.
- **Alternative B.** A total of \$3,365,000 would be spent locally and regionally, having a minor positive, short-term, impact on the regional and local economy.

Extending the operation season of the Lake McDonald Lodge, General Store, food services, and other visitor accommodations five weeks could result in negligible to minor, positive long-term benefits from increased revenue opportunities for all concessioners, although the extended season might increase shoulder season competition with businesses outside the park.

- **Alternative C (Preferred).** The slight increase in guest and employee accommodations would have minor positive, long-term impacts on the local and regional economy. A total of \$6,470,000 would be spent locally and regionally. Construction-based expenditures would have a minor positive, short-term impact on the regional and local economy. Extending the operating season would have the same impacts as under alternative B.
- **Conclusion.** Alternative B would have a negligible negative, long-term impact on the regional and local economy from reducing guest accommodations by 0 to 10 rooms, resulting in reduced visitor spending. Alternative C would have a negligible positive, long-term impact by adding 10-20 guest rooms. Both alternatives would have a negligible to minor, positive, long-term impact from an extended season. All alternatives would have a minor positive, short-term impact on the regional and local economies.

Rising Sun Developed Area

- **Alternative A – Status Quo/ No Action.** A total of \$905,000 would be spent locally and regionally on improvements to the Rising Sun Developed Area. Construction-based spending would have a negligible positive, short-term impact on regional or local communities because the proposed spending level is relatively low.
- **Alternative B.** The addition of 11 employee housing beds would have a negligible positive, long-term impact on local and regional communities. A total of \$1,637,000 would be spent locally and regionally. This construction project would have a minor positive, short-term impact on the regional and local economy.

Extending the operating season of the Rising Sun Motor Inn, Coffee Shop, and General Store/Motel/Dormitory five weeks could result in negligible to minor, positive, long-term benefits from increased revenue opportunities for all concessioners, although the extended season might increase shoulder season competition with businesses outside the park.

- **Alternative C (Preferred).** The addition of 3-8 guest rooms and 24 employee housing beds would have a negligible positive, long-term impact on local and regional communities. A total of \$2,340,000 would be spent locally and regionally. This spending would have a minor positive, short-term impact on the regional and local economy. Extending the operating season would have the same impacts as under alternative B.
- **Conclusion.** Alternatives B and C would have negligible positive, long-term impacts on the regional and local economies from changes to guest accommodations, and negligible to minor positive, long-term impacts from extending the operating season. Alternative C would have a minor positive, long-term impact from the increase in employee housing. All alternatives would have a positive, short-term impact on the regional and local economy from construction activity, varying in magnitude from negligible to minor.

Two Medicine Developed Area

- **Alternative A – Status Quo / No Action.** A total of \$194,000 would be spent locally and regionally on the Two Medicine developed area. The construction-based spending would have a negligible positive, short-term impact on regional or local communities because the proposed spending level is relatively low.
- **Alternative B (Preferred).** A total of \$321,000 would be spent locally and regionally on the Two Medicine developed area. The expenditures under Alternative B would have a negligible positive, short-term impact on regional or local communities from construction activity.

Extending the operating season for the General Store four weeks could provide a negligible positive, long-term benefit due to increased revenue opportunities for all concessioners, although the extended season might increase shoulder season competition with businesses in East Glacier.

- **Conclusion.** Both alternatives would entail negligible positive, short-term and long-term impacts on the regional and local communities from construction-based spending, and extended operating seasons. Alternative B would also have a negligible positive, long-term benefit from extending the operating season.

Many Glacier Developed Area

- **Alternative A – Status Quo/No Action.** A total of \$5,474,000 would be spent locally and regionally on improvements to the Many Glacier developed area. The construction-based expenditures would have a minor positive impact on regional and local communities.
- **Alternative B.** The increase of 4 to 14 guest rooms would result in a negligible positive, long-term impact. A total of \$6,250,000 would be spent locally and regionally on the Many Glacier developed area. Spending under this alternative would have a minor, positive impact on regional or local community economies.

Extending the operating season of the Many Glacier Hotel and other accommodations two weeks could result in negligible, positive long-term benefits from increased revenue opportunities for all concessioners, although the extended season might increase shoulder season competition with businesses outside the park and the Blackfeet Indian Reservation.

- **Alternative C (Preferred).** Adding 14 to 24 guest rooms would result in a minor positive, long-term impact. An increase of as many as 20 employee beds and improvements in employee living conditions would have a minor positive, long-term impact. An estimated \$8,380,000 would be spent on construction at the Many Glacier developed area, having a minor, positive impact on the local and regional economies. Extending the operating season would have the same impacts as under alternative B.
- **Conclusion.** Alternatives B and C add guest accommodations to the Many Glacier developed area, having a negligible to minor, positive impact on local and regional economies from the increase in visitor spending. Extending the operating season would have negligible positive, long-term benefits. Construction-based spending under all alternatives would have a minor positive, short-term impact on the regional and local economy.

Swiftcurrent Developed Area

- **Alternative A – Status Quo/No Action.** A total of \$607,000 would be spent locally and regionally on the Swiftcurrent developed area. These expenditures would have a negligible positive, short-term impact on regional or local communities.
- **Alternative B (Preferred).** Employee housing would increase by up to 65 additional beds, entailing a minor positive, long-term impact. A total of \$2,154,000 would be spent locally and regionally within the Swiftcurrent developed area. The spending would have a minor positive, short-term impact on regional or local communities.

Extending the operating season of the visitor accommodations and Restaurant/Store three weeks could result in negligible positive, long-term benefits from increased revenue opportunities for all concessioners, although the extended season might increase shoulder season competition with businesses outside the park and the Blackfeet Indian Reservation.

- **Alternative C.** Up to 63 additional employee housing beds would result from improvements, having a minor positive, long-term impact. A total of \$2,120,000 would be spent locally and regionally on the Swiftcurrent developed area. Spending under alternative C would have a minor positive, short-term impact on the local and regional economies. Extending the operating season would have the same impacts as under alternative B.
- **Conclusion.** Both alternatives B and C would have a minor positive, long-term impact on local and regional economies from increased spending in the area. Construction-based spending under these alternatives would have minor positive, short-term impacts, while alternative A would have a negligible positive, short-term impact on the regional and local economy. Extending the season would have negligible positive, long-term benefits.

Summary Conclusion

Between 14 and 28 additional guest rooms would be added under alternative C and the preferred alternative for all developed areas. The added number of rooms represents a range increase in lodging capacity of 2.7% to 5.4%. For all developed areas combined, the impact from increased lodging is negligible and positive. However, impacts for the alternatives vary among sites, from negligible to minor and positive, and all impacts would be long-term.

The employee housing capacity could increase by a range of 65 to 121 beds, or as much as 22% over the existing number of beds. However, it is possible that the employee housing needs for Many Glacier and Swiftcurrent could be significantly reduced by the combination of alternatives selected for those two areas.

All of the preferred alternatives would result in a moderate positive, long-term impact from enhancing the quality, safety and capacity of employee housing. This improvement would allow concessioners to retain a diverse, qualified staff allowing for the extension of the operating season and resulting in a minor positive, long-term impact on local and regional communities. While improved employee housing might affect the concessioners' incentive to hire locally, this would affect a small number of prospective employees, based on the size of the local workforce currently working for concessioners in the park. To offset this potential negative impact, concessioners are encouraged to recruit and hire locally, including Blackfeet and Confederated Salish and Kootanai Tribe members.

The extension of the developed areas' operating seasons would result in positive, long-term impacts on revenues and employment opportunities; although shortening the off-season when much of the maintenance and construction work occurs could result in a negligible negative, long-term impact on local and regional communities.

Estimated construction-based spending in regional and local communities would be in the range of \$8.7 million to \$22.0 million, depending on the alternative selected for each site. Including both direct and indirect spending, a range of \$9.9 million to \$30.8 million would be spent in the regional and local communities. An increase in construction spending and employment during the implementation of the alternatives would have a minor positive, short-term impact on regional and local communities. A potential increase in wages of the regional and local general building construction workforce by 4.1% to 10.0% would be significant during the peak construction period. However, the peak construction period would be expected to last about three years, diminishing over the remaining years of the plan's implementation. The modest magnitude of construction-based spending in the regional local economy relative to the size of the surrounding communities indicates that impacts on the overall economy would likely be negligible. Direct construction-based spending would amount to a range of 0.08% to 0.20% of the total regional wages during the three peak years of construction.

Expanding commercial services could increase employment opportunities and cause negligible to minor positive, long-term impacts. If construction and rehabilitation work takes place during the visitor season, minor to moderate adverse, short-term impacts on concessioner operations would occur. If concessioner operations are adversely affected and a decrease in guest rooms occurs during any single visitor season, a negligible to minor, short-term impact to regional and local economies would result from a decrease in visitor spending.

Overall, it is not anticipated that the Commercial Services Plan would have a significant impact on visitor spending, although the opportunity for higher spending levels per visitor would be enhanced through the commercial services improvements. The short-term, positive impacts created by construction work and the long-term preservation of visitor use facilities together prevent any negative long-term impact on the local and regional communities. Otherwise, if the Commercial Services Plan were not implemented, a negative impact could result from neglect and lower levels of service.

Cumulative Impacts

Cumulative impacts are anticipated from the Commercial Services Plan in combination with the anticipated Going-to-the-Sun Road Rehabilitation project, the continuing Many Glacier Hotel renovation and the expected continuation in strong regional construction activities associated with population growth in the three-county region. A regionwide increase in construction spending and employment associated with other construction projects would have a moderate positive, short-term impact on regional and local communities. The local construction workforce might be expanded in the short-term, or alternately, additional workers from outside local and regional communities might take advantage of job opportunities from these additive projects.

THE BLACKFEET AND THE CONFEDERATED SALISH AND KOOTENAI TRIBES

Methodology

Impacts on the Blackfeet Nation and Confederated Salish and Kootenai Tribes were qualitatively assessed based on information obtained through consultation with park staff.

Thresholds of impact are defined in Table 4.1.

- *Negligible*: Effects from changes would be below or at the level of detection.
- *Minor*: Effects would be detectable but changes in employment rates or cultural impacts would be slight.
- *Moderate*: Effects would cause an apparent change in employment rates or would have apparent cultural impacts.
- *Major*: Effects would have an important impact on employment rates or park resources that have religious or cultural significance to the Blackfeet or Confederated Salish and Kootenai Tribes.
- *Short-term*: Would occur during construction
- *Long-term*: Would be continual or permanent

Impact Analysis For Necessary and Appropriate Services Alternatives

All Services and Developed Areas

None of the alternatives would be expected to have any adverse socioeconomic impacts on the Blackfeet and the Confederated Salish and Kootenai Tribes (Salish and Kootenai). The alternatives are not expected to alter the current level of recruiting and hiring of members of the Blackfeet and the Salish and Kootenai for concessioner- and construction-related employment in the developed areas. Service and guided activity alternatives that propose to add additional operators or concessioners, however, could have a positive socioeconomic impact on the Blackfeet, and the Salish and Kootenai by creating more employment opportunities. Although additional operator and concessioner contracts would not be offered or awarded solely to the Blackfeet or the Salish and Kootenai, opportunities to bid on and receive contracts and additional employment opportunities for the tribal members would be created.

Additionally, it is anticipated that the alternatives would have no impact on park resources that have religious or cultural significance to the Blackfeet or the Salish and Kootenai.

Conclusion

None of the alternatives would be expected to have any adverse socioeconomic or cultural impacts on the Blackfeet or the Confederated Salish and Kootenai Tribes of the Flathead Reservation. Service and guided activity alternatives that propose to add operators or concessioners would create additional contract or employment opportunities and could have moderate long-term, positive impacts on the Blackfeet and the Confederated Salish and Kootenai Tribes.

Cumulative Impacts

No cumulative impacts are anticipated.

VISITOR USE AND EXPERIENCE

Methodology

Impacts on visitor use and experience were assessed using data and information obtained through consultation with park staff and the architectural and planning consultant for the Commercial Services Plan. Information gathered from park files, review comments by park staff, and other environmental assessments and environmental impact statements was also used in the analysis.



Thresholds of impact are defined in Table 4.1.

- *Negligible:* 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 impacts.
- *Minor:* Changes in visitor use and/or experience would be detectable, although the changes would be slight.
- *Moderate:* Changes in visitor use and/or experience would be apparent.
- *Major:* Changes in visitor use and/or experience would be readily apparent and would have important consequences.
- *Short-term:* Would occur during implementation
- *Long-term:* Would be continual or permanent

Impacts Common to All Action Alternatives

Operating seasons. Extending the operating seasons for the developed areas would provide visitor services earlier and later than has been typical during the past few years. For visitors, there will be more days available for visits during the early and late seasons. These extended seasons provide opportunities to visit key areas of the park without crowds and in cool weather, and to experience late spring and early fall in the high country. The result is a minor positive, long-term benefit for visitors who are free of school schedules.

Impacts from construction. All alternatives involving construction or rehabilitation would result in short-term, site-specific, adverse impacts on visitors if work occurs during the visitor season. Increased noise, the presence of construction equipment and potential temporary closure of some guest accommodations or services during construction would have minor site-specific, adverse, short-term impacts on visitor use and experience.

Impact Analysis For Necessary and Appropriate Services Alternatives

Alternative A – Status Quo/No Action. Alternative A for the services discussed below would have no new effects on visitor use and experience.

Action Alternatives

Granite Park Chalet: Alternative B (preferred) would have minor positive, long-term impacts from improved restroom facilities, availability of potable water in the chalet and consequent improved

sanitation levels for food preparation and hygiene. Alternative C would have the same impact as alternative B, but would have a longer negative impact from major construction.

Guided Day Hiking: Alternative B (preferred) limits the size of guided hiking groups both in day use and backcountry zones. The effect on visitors would be minor, positive and long-term by providing trails in better condition, and opportunities to experience the wilderness of the park with fewer hikers. This alternative would also enable visitors to be in closer proximity to guides giving interpretive talks.

Guided Underwater Diving Tours: Alternative B (preferred) would add the new educational benefit of studying underwater lake environments, enabling visitors to appreciate the rich variety of ecosystems in Glacier National Park. The result would be a negligible to moderate, positive, and long-term effect.

Firewood Sales: Alternative B (preferred) would increase the availability of firewood, enabling visitors to be comfortable in the cool evenings and erratic weather that are part of the experience in northern parks. It would also provide more opportunities for visitors to use fire pits and fireplaces, enhancing the experience of the park's rustic setting. These actions would have a negligible, positive, long-term impact. However, experiencing the pristine park environment could be affected by smoke from additional fires, having a minor negative, short-term effect for some visitors.

Public Showers: The effects of **alternative B (preferred)** would be moderate positive, and long-term for visitors who camp or stay in the cabins at Swiftcurrent by providing easy access to showers and improved sanitation at campgrounds. Overall, because more visitors use hotel or motel accommodations, the effect would be negligible, site-specific and long-term.

Boat Tours and Transportation (Boat Taxi): In **alternative B (preferred)**, the effect would be minor positive, and long-term for visitors seeking the historic boat trip experience to Lake McDonald Lodge; with its historic views and cultural resource education. Shuttle trips between Apgar and the lodge for shopping or dining would also have a negligible positive, long-term effect.

Guided Interpretive Motor Vehicle Tours and Public Transportation: These services would continue to affect visitation in a negligible, positive, and long-term manner. In alternative B, providing new services for vehicle drop-off and pick-up, allowing visitors to unload gear and leave their vehicles in security while touring, riding or hiking would have a minor positive, long-term effect. For sightseers who use the parking lots, freeing valuable parking spaces at popular destination locations under this alternative would provide a moderate positive, long-term benefit.

Horseback riding and horse packing services: The effect of **alternative A (preferred)** on visitors seeking a western horse experience would be negligible positive, long-term. For other visitors, the continued occurrence of flies, waste on trails and odors in developed areas would have moderate negative, short-term effects.

Guided bicycle tours: Under **alternative B (preferred)**, the bicyclists, particularly first-time riders, would experience less crowding and safer riding conditions, resulting in minor, positive, and long-term impacts. For motoring visitors, safer lane traffic and shorter waits on uphill road sections would result in negligible positive, and long-term impacts during the occasional encounter with cycling groups.

Commercial step-on guide services: In **alternative B**, skilled guides for bus and private vehicle tours in the park would personalize the visitor experience, resulting in minor positive, and long-term impacts. Seniors, foreign visitors, and persons with disabilities would benefit from the flexibility and convenience of this service.

Guided motorcycle tours: Under **alternative B**, this new visitor service would affect a small portion of the park's total visitation pool. The inclusion of educational guides would have a moderate positive, long-term benefit for motorcycling visitors. For other visitors, additional noise and occasional encounters with motorcycle traffic would result in minor negative, long-term impacts.

Conclusion

Construction would cause some minor short-term, adverse impacts during implementation. Except for horseback riding / packing, all preferred alternatives would have an overall minor, positive, long-term effect on visitor use and experience. Guided day hiking, bicycling, motorcycle, and commercial step-on tours would have a parkwide impact along transportation corridors, while impacts from the remaining services would be local or random. Alternative A for horseback riding / packing would have both positive and negative effects.

There would be no significant adverse impacts on visitor services or opportunities whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of visitor services as a result of the implementation of any of the alternatives.

Alternative A – Status Quo/No Action for all developed areas: For all the developed areas discussed below, visitors would continue to benefit from continued services maintained under alternative A. In addition, this alternative would include changes to facilities to resolve needed building life/safety and code compliance issues. Besides minor to moderate, negative, short-term impacts because of inconvenience and noise, these construction projects would impose few constraints on visitors since the work would be scheduled over more than ten years and would affect only a few sites during any one year. Impacts under alternative A also apply to the other alternatives.

Action Alternatives

Apgar Developed Area

- **Alternative B (Preferred).** For visitors staying in Apgar Village, improving Village Inn room privacy, separating pedestrians and traffic, expanding opportunities for bicycling, and creating an enhanced lakeshore experience for pedestrians would result in moderate, positive, long-term effects. Extending the operating season of the Village Inn eight weeks (three weeks earlier and five weeks later) would result in increased opportunities for visitors to stay overnight. Day use visitors might experience increased activity and noise, less wildlife and some degradation of resources. There would be moderate positive and negative, long-term effects. For visitors who briefly sightsee in Apgar, the impact would be negligible.
- **Alternative C.** Increased pedestrian/bicycling opportunities, modern accommodations, and a dramatic sense of entry to the lakeshore and mountain views in this gateway community for the park would create a major positive, and long-term impact. The impact on visitors who anticipate lakeshore room accommodations with a view, this alternative's effect would be major negative, and long-term. Impacts from expanding the operating season in alternative B also apply to this alternative.

- **Conclusion.** Alternative A has only a negligible, positive, long-term effect on visitors since proposed actions are enhancements rather than a change to the Apgar experience. The alternative B (preferred) effect is more moderate long-term, and positive since actions provide lodging privacy, create better pedestrian / traffic separation, expand the opportunities for cycling.

Alternative C expands this effect by radically changing the village experience. A visitor whether first-time or returning would experience a markedly different lakeshore and lodging experience.

There would be no significant adverse impacts on visitor services or opportunities whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of visitor services as a result of the implementation of any of the alternatives.

Lake McDonald Developed Area

- **Alternative B.** Making services more readily available and reducing pedestrian/traffic congestion would have positive impacts. Extending the operating season of Lake McDonald Lodge, the General Store, and other visitor accommodations by five weeks (two weeks earlier and three weeks longer) would allow visitors to stay overnight and utilize the commercial facilities. The extended season would help offset the minor reduction in accommodations. The effects of these actions would be positive, minor to moderate and long-term. Current off-season visitors might be affected by an increase in traffic, noise and activity from current levels. There could be less wildlife and some possible increase in resource degradation. For these visitors, there would be a negative moderate, and long-term affect.
- **Alternative C (Preferred).** Adding a boat trip from Apgar to Lake McDonald would allow visitors to enjoy a leisurely trip and experience the historical approach to the area. In addition, increasing accommodation options, visually unifying the site architecture, and improving traffic capacity and safety would benefit visitors. Effects would be major long-term, and positive on the general visitor experience. The impacts from extending the operating season under alternative B also apply to this alternative.
- **Conclusion.** Much of the construction under all alternatives could be scheduled during the non-peak and closed months, resulting in a negligible, adverse, short-term impact on the early or late season visitor experience. However, the extensive building program under alternative C would entail limited food services and dormitory work. Alternative B, and to a greater extent alternative C (preferred), would enhance the historic setting, allow for greater comfort amenities, and return the site area to day and overnight use by guests only. The effect of these actions would be major, positive, and long-term.

There would be no significant adverse impacts on visitor services or opportunities whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of visitor services as a result of the implementation of any of the alternatives.

Rising Sun Developed Area

- **Alternative B.** Extending the operating season of the Coffee Shop and General Store/Motel/Dormitory and visitor overnight accommodations five weeks (three weeks earlier and two weeks longer) would also increase the opportunities for visitors to stay in the Rising Sun area and utilize the facilities. Visitors might experience an increase in noise, traffic and activity from current levels. There would be less wildlife and some possible increase in resource degradation. In addition, this alternative would add cabins and expand shopping, public showers, and self-service laundry services. Impacts would be positive and negative, moderate and long-term.
- **Alternative C (Preferred).** Changing the current mixture of motel rooms and cabins combined with the separation of employee and visitor areas would result in higher room availability and a quieter experience with moderate long-term, and positive effects on visitors. Impacts from expanding the season under alternative B also apply to this alternative.
- **Conclusion.** Strategic scheduling under alternative A could result in negligible short-term, adverse impacts from construction. Other actions under this alternative would have minor long-term, positive impacts on the typical visitor. Alternative B would expand the services, resulting in moderate long-term, positive and negative impacts. Under alternative C, an increase in accommodations and quiet would have a moderate long-term, positive impact.

There would be no significant adverse impacts on visitor services or opportunities whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of visitor services as a result of the implementation of any of the alternatives.

Two Medicine Developed Area

- **Alternative B (Preferred).** An enhanced lakeshore, historically appropriate architecture / site design, and safe connections to camping areas in this alternative would result in major positive, long-term impacts. Extending the operating season for the General Store four weeks (one week earlier and three weeks later) would provide extended services to visitors using the area. The affects would be positive, minor and long term.
- **Conclusion.** Strategic scheduling under alternative A could result in negligible negative, short-term impacts from construction. A similar impact during construction in alternative B would be expected. Visitors would be able to enjoy unencumbered natural views, lakeshore educational opportunities, and safe, accessible pathways between trails, campground, store, and lakefront activity areas. The effects on the visitor would be major, long-term, and positive.

There would be no significant adverse impacts on visitor services or opportunities whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of visitor services as a result of the implementation of any of the alternatives.

Many Glacier Developed Area

- **Alternative B.** Extending the operating dates of the Many Glacier Hotel and other accommodations two weeks (one week earlier and one week later) would increase the opportunities for visitors to stay in the Many Glacier area and utilize the facilities. This extension, combined with opportunities to experience the most scenic views, learn about the area's history, and enjoy the original hotel lobby experience would have a positive, moderate and long-term effect. There could be some moderate negative, long-term effects with less wildlife and some possible increase in resource degradation due to an increases in noise, traffic and activity during extended season weeks.
- **Alternative C (Preferred).** Replicating additional hotel interior spaces and providing interpretive guides would enhance educational opportunities for visitors. Removing all employee activities from the hotel and the rehabilitated Lower Dormitory would increase room opportunities for guests and create a formal resort atmosphere, with separation between employees and visitors. Together, all of these actions would have major long-term, positive effects on the visitor experience. There would be some negative, moderate, and long-term affects on wildlife and possible increases in resource degradation due to additional noise, traffic and activity from new dormitory areas. The impacts under alternative B from extending the season would also apply to alternative C.
- **Conclusion.** Although alternative A would have localized, minor to moderate, adverse impacts during construction, the completed improvements would preserve the hotel's historic integrity and have a moderate positive, long-term, effect on the visitor experience. Impacts under alternative B would also have moderate positive, long-term impacts by further enhancing the character defining features of the area's cultural landscape and the hotel. Alternative C would have the greatest impact on visitor use by revitalizing additional historic elements of the hotel, adding guest accommodations and separating the employee area from guests. These actions would result in a major positive, long-term impact.

The action alternatives would have some negative, moderate, and long-term affects on wildlife, with possible increases in resource degradation due to additional noise, traffic and activity.

There would be no significant adverse impacts on visitor services or opportunities whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of visitor services as a result of the implementation of any of the alternatives.

Swiftcurrent Developed Area

- **Alternative B (Preferred).** Emphasizing the historic cabin ring setting, providing safer walk paths, and lowering noise levels in guest areas in conjunction with new cabin-only guest accommodations would result in moderate negative, long-term impacts for some bus tour groups who prefer motel rooms with individual bathrooms or a block of rooms grouped together. In contrast, the availability of more 1930s-style cabins would provide many visitors with an historic, rustic experience and result in moderate positive, long-term impacts. Extending the operating dates of the Restaurant/Store and visitor accommodations three weeks (two weeks earlier and one week later) would increase the opportunities for visitors to stay in the Swiftcurrent area and utilize the

facilities. Visitors might experience an increase in noise, traffic and activity from current levels. There would be less wildlife and some possible increase in resource degradation. The effects would be positive and negative, moderate and long-term.

- **Alternative C.** Preserving the current mixture of motel rooms and cabins, adding new accommodations, and improving safety in cabin areas would result in a minor, long-term positive impact on visitor experiences. Impacts from extending the operating season in alternative B also apply to alternative C.
- **Conclusion.** Strategic scheduling under alternative A could result in negligible short-term, adverse effects from construction. Under alternative B, overall improvements would have a moderate positive, long-term effect on visitors by preserving the rustic experience of cabin rings and improving visitor safety. Other than adding rooms, alternative C would have less impact on the visitor experience, and impacts would therefore be minor long-term, and positive. With an extended season, there could be less wildlife and some possible increase in resource degradation. These effects could be negative, moderate and long-term for some early and late season visitors.

There would be no significant adverse impacts on visitor services or opportunities whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the *General Management Plan* (NPS 1999) or other relevant NPS planning documents. Consequently, there would be no impairment of visitor services as a result of the implementation of any of the alternatives.

Cumulative Impacts

Visitor services have changed over the years in response to the use of automobiles, a desire for educational opportunities, accessibility requirements, and the demand for camping options. Impacts on visitor experiences extend beyond the boundaries of the park where demand for dining, sales, and accommodations increases with cycles of visitation. However, with the park as the destination goal, the overall effect on the visitor experience outside the park would be minor, positive, and long-term as long as the quality of facilities in the park is maintained.

Continuing repairs and improvements to existing facilities, especially at Many Glacier and Lake McDonald, would further preserve the historic assets and affect future visitor experiences in a minor to moderate, long-term, positive manner. Planned improvements in all developed areas would resolve current building condition and code problems. Upgrading of sewer and water utilities at key locations would result in safer and more environmentally sensitive facilities, and improve visitor accommodations and services. Reasonably foreseeable projects for improving facilities would have localized impacts on the visitor experience, but a cumulatively moderate, positive, long-term effect. The combined impact of all actions both inside and outside the park for any of the alternatives would have a minor to moderate, positive, long-term, regional effect on visitor experience and use.



ENERGY CONSUMPTION

Methodology

Current energy sources and requirements were assessed through consultation with Glacier National Park staff. Assessments of potential impacts on energy consumption were based on comparison between existing conditions and anticipated future conditions associated with implementation of the alternatives.

Thresholds of impact are defined in Table 4.1.

- *Negligible*: Effects would be below or at the level of detection. The effect would be slight.
- *Minor*: The effects would be detectable, but impacts would be small and would not have an appreciable effect on parkwide energy consumption.
- *Moderate*: The effects would result in readily apparent and widespread changes in energy consumption.
- *Major*: The effects would be readily apparent and would cause substantial changes to energy requirements on a regional scale.
- *Short-term*: Would occur during implementation
- *Long-term*: Would be continual or permanent

Impact Analysis For Necessary and Appropriate Services Alternatives

Granite Park Chalet

- **Alternative A – Status Quo/No Action.** This alternative would have no new impact on energy consumption. Sanitary waste would continue to be flown out by helicopter, and propane would continue to be the available energy source.
- **Alternatives B (Preferred) and C.** Improving the sanitary system under the Preferred Alternative would allow sanitary waste treatment to occur on-site, and energy requirements to haul wastes by helicopter would be eliminated. Under alternative C, providing full service dining and lodging accommodations would result in a minor increase in non-grid energy consumption from the current level of use at the chalet. The proposed addition of a photovoltaic system to the chalet under alternatives B and C, however, would reduce propane use.

Boat Tours and Transportation (Boat Taxi)

- **Alternative A – Status Quo/No Action.** Current interpretive boat tours and transportation services would have no new impact on energy consumption.
- **Alternative B (Preferred).** Added tour boat services on Lake McDonald would result in a negligible increase in energy consumption.

Guided Interpretive Motor Vehicle Tours and Public Transportation

- **Alternative A – Status Quo/No Action.** Assuming that motor vehicle tours, and shuttle and taxi services reduce the overall number of vehicles on park roads, continuing to provide these services under alternative A would continue to reduce overall energy consumption by vehicles in the park.
- **Alternative B (Preferred).** Expanding these services and providing private vehicle shuttle services under alternative B would have a negligible influence on the amount of vehicles currently on park roads and would result in a negligible decrease in energy consumption.

Conclusion

Equipment and vehicles used for construction and maintenance under all alternatives would result in a negligible short-term increase in park-wide energy consumption.

Alternative A for Granite Park Chalet would have no new impact on energy consumption. Alternatives B and C would result in a minor, long-term decrease in energy consumption because sanitary waste would be treated on-site, and helicopters would no longer be required to haul sanitary waste from the chalet. Under alternative C, providing full service accommodations would result in a negligible, long-term increase in energy consumption.

Alternative A for tour boat and transportation services would have no new impact on energy consumption. Under alternative B, added services would have only a negligible, long-term increase on energy consumption.

Alternative A for interpretive motor vehicle tours and public transportation would continue to reduce overall energy consumption from vehicles. Under alternative B, expanded services would cause a negligible, long-term decrease in energy consumption.

All Developed Areas

Construction and maintenance activities: Equipment and vehicles used during the construction and repair of visitor service facilities would result in a negligible short-term increase in park wide energy consumption.

Long-term operation of developed areas: The operation of new guest and employee facilities in Lake McDonald, Rising Sun, Many Glacier and Swiftcurrent developed areas would result in a negligible increase in energy consumption. Energy-conserving technology would be incorporated in the design of new facilities. Improvements to existing facilities in the developed areas such as electrical upgrades and the replacement of older heating units, as well as the installation of new windows, would improve energy efficiency in some existing buildings. Overall, any increase in energy consumption from the developed area alternatives would be negligible.

Conclusion

Equipment and vehicles used for construction and maintenance under all alternatives would result in a negligible short-term increase in park-wide energy consumption.

Overall impacts from actions proposed in the Apgar Village, Lake McDonald, Rising Sun, Many Glacier and Swiftcurrent developed areas would result in a negligible, long-term, park wide increase in energy consumption.

There would be no significant adverse impacts on energy resources whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation of Glacier National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the 1999 *General Management Plan* or other relevant NPS planning documents. Consequently, there would be no impairment of energy resources as a result of the implementation of any of the alternatives.

Cumulative Impacts

Reasonably foreseeable future projects outside of the park, including road and bridge improvement projects, as well as U.S. Forest Service timber salvage and resource rehabilitation projects, would result in short-term increases in energy consumption by construction equipment. Going-to-the-Sun Road rehabilitation work inside the park would also cause increased energy consumption during construction. Additive impacts from energy use for future projects outside and inside the park combined with any of the alternatives would result in a minor short-term, regional increase in energy consumption. No long-term cumulative impacts on energy resources are anticipated.

LANDOWNERS IN AND ADJACENT TO PARK BOUNDARIES

Methodology

Alternatives were evaluated on the basis of data and other information gathered from consultation with park staff, and from examining Geographic Information System (GIS) thematic layers (available through the park's GIS coordinator), and survey reports. There are no private lands in Two Medicine, Many Glacier, Swiftcurrent or Rising Sun. Therefore, no impact analyses of these areas were conducted.

Thresholds of impact are defined in Table 4.1.

- *Negligible*: Changes would be below or at the level of detection.
- *Minor*: Changes would be detectable, although the changes would be slight.
- *Moderate*: Changes would be apparent.
- *Major*: Changes would be readily apparent and would have important consequences.
- *Short-term*: Would occur during implementation
- *Long-term*: Would be permanent

Impact Common to All Alternatives

Temporary inconveniences to landowners, such as increased noise and congestion from construction vehicles and equipment might occur from nearby construction and rehabilitation activities; however, these adverse impacts would be short-term and minor. Disrupted quiet and decreased natural environment surrounding private lands due to potential increased development adjacent to private lands would cause minor to moderate long-term, adverse impacts.

Although the commercial services plan alternatives are not expected to significantly increase the total number of visitors to the park, improving the developed areas and providing additional visitor opportunities could attract more park visitors to developed areas or could increase the average amount

of time visitors spend in developed areas. A potential increase in visitors in the Apgar Village developed area could increase the commercial value of private property. Impacts from a potential increase in commercial value of private property would depend on the alternative but would be long-term and positive. The Apgar Village developed area contains private land that has been developed for residential and commercial uses, whereas the Lake McDonald developed area is primarily residential.

There would be no impacts on private lands from necessary and appropriate commercial services that occur outside the developed areas, such as guided hiking, backpacking and boat tours, etc.

Impact Analysis For Necessary and Appropriate Services Alternatives

Apgar Village Developed Area

- **Alternatives A – Status Quo/No Action, B (Preferred) and C** would have short-term adverse impacts during construction as described above for all alternatives. In addition, alternatives B and C could disrupt quiet and natural environment surrounding private lands as described above for all alternatives if new parking lots and/or lodging are constructed adjacent to private land. This would cause minor long-term, adverse impacts on private landowners. All alternatives would improve parking and circulation, which would have moderate positive, long-term impacts on landowners. Under alternative C, if the Village Inn is removed from the lakeside, the private land currently situated behind the Village Inn (southwest of the Village Inn) would become lakefront property. This action would significantly increase the commercial value of this private property and would have a major long-term, positive impact on the landowners.
- **Conclusion.** Both negative and positive impacts on private landowners would result from the action alternatives. Construction activities would cause short-term adverse impacts. Disruption of quiet resulting from new buildings and/or parking lots located closer to current residential properties would cause minor long-term, site-specific negative impacts. The potential increase in commercial property value through enhanced lakefront visibility, accessibility, circulation and parking would have a major long-term, positive impact for landowners.

Lake McDonald Developed Area

- **Alternatives A – Status Quo/No Action, B and C (Preferred)** would have short-term adverse impacts during construction as described under impacts common to all alternatives. Adaptive use of Stewart Motel for management-level employee housing in alternative B would have negligible, adverse impacts on adjacent landowners. Employee recreational and support facilities would be located away from private lands behind the existing Coffee Shop and should have no direct effect on the private landowners. The reconstruction of motel facilities at the Stewart Motel site in alternative C would have minor short term, adverse impacts on the adjacent landowners.
- **Conclusion.** Impacts on landowners in all alternatives would be minor and adverse. Alternatives B and C would disrupt the quiet that is adjacent to private lands during construction, resulting in minor short-term, site specific, adverse impacts on landowners.

Cumulative Impacts

There would be no cumulative impacts from projects occurring outside the park combined with any of the alternatives. Additive impacts from the Going-to-the-Sun Road rehabilitation and the commercial services plan alternatives could cause minor short-term, adverse cumulative impacts on private landowners in the park during construction.

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This section describes whether any long-term management possibilities or the productivity of park resources are being traded for the immediate use of land under any of the alternatives.

Approximately 14-20 acres of land would be committed to a long-term use within the existing developed areas under all the action alternatives. New development would cause soil compaction, displaced wildlife and removal of vegetation. Noise and construction activities would also displace wildlife and disrupt visitors in the short term, but would not affect long-term productivity.

Rehabilitation of historic facilities during the short term would result in enhanced long-term productivity of historic resources by preserving them. Upgrading facilities to comply with life safety, accessibility and building codes in the short term would also result in enhancement of long-term productivity to resources and visitors.

None of the commercial service alternatives would affect long-term productivity of park resources because they are not consumptive uses and do not require additional development in the park.

UNAVOIDABLE ADVERSE IMPACTS

This section summarizes unavoidable adverse impacts. An impact is unavoidable if the action would result in impacts that cannot be fully mitigated.

Short-term adverse impacts on water quality, soils, vegetation, wildlife, natural sound, air quality, historic resources, visual resources, energy consumption, and landowners in the park would be unavoidable for all alternatives. An increase in sedimentation from erosion of disturbed soils associated with construction and/or repair would cause minor to negligible short-term, adverse impacts on water quality. Soil erosion and compaction from equipment would cause unavoidable negligible, short-term, adverse impacts on soils. Temporary disturbance and vegetation trampling during all construction work would have negligible to minor, short-term adverse impacts on vegetation. All alternatives involving construction and/or repair would introduce temporary but increased noise into the park during construction, and unavoidable adverse impacts on natural sound would be minor and short-term. An increase in dispersed dust and exhaust emissions would cause unavoidable negligible to minor short-term, adverse impacts on air quality during construction, rehabilitation and maintenance. Unavoidable minor to moderate short-term, adverse impacts on historic resources would include temporary changes to the historic setting of a historic district or a historic building due to either the presence of construction equipment and materials, or actual temporary changes to buildings during rehabilitation work. Similarly, the presence of construction equipment would result in minor short-term, adverse impacts on visual resources. Equipment and vehicles associated with construction would cause a negligible but unavoidable short-term increase in parkwide energy consumption. Temporary inconveniences to landowners from nearby construction and rehabilitation activities would cause minor short-term, unavoidable impacts.

Adverse impacts on water quality from an increased amount of hardened surfaces in the developed areas would be unavoidable. Hardened, impermeable surfaces would reduce the amount of soil and vegetation available to filter runoff, thereby increasing pollution; however, drainage control measures

would be implemented to minimize impacts on water quality. The construction of new guest and employee facilities as well as new parking lots would cause unavoidable adverse impacts on soils, vegetation, and wildlife habitat. Long-term loss of soil productivity where new facilities and parking lots would be placed would be unavoidable. Similarly, some vegetation clearing, loss or degradation of wildlife habitat, and placement of new facilities in wildlife corridors would be unavoidable.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section summarizes the irreversible and irretrievable commitments of resources that are associated with alternatives. Irreversible commitments cannot be changed over the long-term or are permanent. An impact to a resource is irreversible if the resource cannot be reclaimed, restored or otherwise returned to its condition before the disturbance. Irretrievable commitments are those that result in the loss of production or use of a resource. An impact to a resource is irretrievable if, once gone, the resource cannot be replaced.

The permanent placement of new buildings, parking lots and hardened pathways would result in an irreversible loss of between 14–20 acres of soil resources due to the long period of time that would be required to restore productivity to affected soils. The removal of a total of between 14–20 acres of vegetation for all alternatives together would cause an irretrievable commitment of vegetation as well as a loss in wildlife habitat, including federally and state-listed wildlife habitat.

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Chapter 5 Consultation and Coordination





Chapter 5 Consultation and Coordination

INTRODUCTION

This chapter describes the history of public involvement prior to and during the development of the *Draft Commercial Services Plan and Draft Environmental Impact Statement*. It summarizes coordination with federal and state agencies and tribal governments, and lists agencies, organizations and individuals that received copies of the document.

PUBLIC INVOLVEMENT

Public involvement in the planning process helps to ensure that the National Park Service understands and considers the public's interests when considering alternatives and making decisions about public lands. Public involvement activities provide the means for the public to participate in the planning process, identify issues and alternatives, and express thoughts, ideas, and concerns. Public participation helps to identify the types of actions to be included in the plan, as well as the range of alternatives and impacts that should be addressed. In addition to public involvement during the commercial services planning process, extensive opportunities were offered to the public to comment on commercial services during the development of Glacier National Park's 1999 *General Management Plan and Environmental Impact Statement* (NPS 1990c). The comments submitted during that process were also considered during development of the *Draft CSP and Draft EIS*.

The following concerns were expressed by the public during the development of the *General Management Plan and EIS* that are relevant to the *Draft CSP and Draft EIS*:

Continue Current Access and Visitor Use

An overwhelming majority of comments objected to the possibility of losing public access and visitor opportunities and strongly expressed a desire to keep the park "as it is." Most people want visitor facilities to be retained, including ... grand hotels and other lodging, and campgrounds. The majority said they would like other traditional uses of Glacier National Park to continue,...

Manage the Park to Protect Resources, While Allowing Visitor Use

Most who commented about natural and cultural resources asserted that the park's

paramount priority should be to protect these invaluable assets and lessen the impact of visitation whenever possible. They went on to say that human use consistent with preserving these resources must continue, that people are now part of Glacier's ecosystem, and that habitat can be protected without keeping people out.

Preserve Wildlife Habitat

Most respondents said that they believe that wildlife is central to a true Glacier National Park experience and that habitat should be preserved. Those who commented about wildlife also stressed the need to minimize interactions between animals and people.

Emphasize the Retention of Facilities In the Park

Commenters said that removing facilities from inside the park and replacing them outside the park would result in a loss of valued traditional visitor experience. The public generally did not favor moving facilities outside the park. (NPS 1999c, 6-8)

SCOPING FOR THE COMMERCIAL SERVICES PLAN

The scoping period for the *Draft CSP and Draft EIS* began with the publication of the "Notice of Intent" in the *Federal Register* on September 12, 2000. As part of the process, a scoping newsletter was made available to the public in November 2000, a Commercial Services Plan Web page was established, and five open houses were held in December 2000. The newsletter introduced the *Commercial Services Plan/Environmental Impact Statement*, explained what commercial services are and what the plan would do, and reviewed decisions reached in the 1999 *General Management Plan and Environmental Impact Statement* regarding commercial services. The newsletter also introduced the Commercial Services Plan Web page and invited the public to attend public open houses. Individuals or groups were also invited to share comments, concerns, and ideas by using the online response form or mailing comments to the park by December 30, 2000. Meetings were held with the Blackfeet Tribal Council, private landowners in Apgar and special interest groups.

The Commercial Services Plan Web page provided the public with information on the plan and planning process, identified opportunities for the public to provide comments and ideas, and made available an online comment form.

Open houses were held in Kalispell, Missoula, Great Falls, and Browning, Montana, and in Lethbridge, Alberta, Canada, in December 2000. Approximately 250 people attended.

TABLE 5-1. PUBLIC OPEN HOUSES FOR THE COMMERCIAL SERVICES PLAN

Location	Date	Number of People in Attendance
Kalispell, MT	December 4, 2000	92
Missoula, MT	December 5, 2000	43
Great Falls, MT	December 6, 2000	25
Browning, MT	December 7, 2000	31
Lethbridge, Alberta, Canada	December 7, 2000	56

Over 200 comments were received from the public during the scoping period. These comments were in the form of letters, Web site responses and comments recorded at open houses. In addition, notes on public comment at the public meetings were captured on flip charts and retained as part of the record. Public comments fell into several categories.

- **Lodging Facilities**

Respondents generally said that traditional lodging experiences are important to the character of Glacier National Park and that overnight accommodations should continue to be provided in the park. Most comments supported the rehabilitation of existing lodging facilities but objected to new development in the park. Generally, comments raised objections to an increased number of rooms for overnight accommodations, but suggested small expansions of currently developed areas, such as expansions of the cabins at Rising Sun and Swiftcurrent.

Respondents favored keeping the park as it is and rehabilitating the historic lodging facilities to reflect their primary motif. The public generally said that facilities should be rehabilitated but should maintain a rustic character with few added amenities.

- **General Visitor Services**

While the majority of respondents strongly objected to the commercialization of the park in general, many comments made specific suggestions regarding visitor services. Respondents suggested adding services, such as coin-operated laundry facilities, additional shower facilities, more convenience stations, picnic tables outside the cabins at Swiftcurrent, galleries for local arts and crafts, a small-scale food/drink service at Logan Pass, and expanded services in the North Fork area. Some comments also favored limited retail sales by more than one concessioner.

- **Natural Resources**

Most people who commented on natural resources said that the park's first priority should be to protect natural resources and lessen the impact of visitation while continuing to provide visitor services. Respondents expressed concern about impacts to wildlife, habitat loss, water quality, noxious weeds management, soil compaction, and noise pollution. Commenters also said that the park must be managed to preserve its wilderness characteristics.

- **Affordability**

Many respondents expressed concern that visitor services and facilities would become too costly. They went on to say that some facilities, such as Swiftcurrent and Granite Park Chalet, should be kept affordable. Commenters were also concerned that park entrance fees would increase as a result of hotel rehabilitation.

- **Funding**

Comments expressed a wide range of opinions regarding rehabilitation funding. Suggestions to fund rehabilitation include using taxpayer money, increasing park fees or park lodging rates, using a percentage paid by the concessioner, using private money, and using National Park Service allocated funds.

- **Guided Activities**

Most people who commented on guided activities said that group size limits should be placed on all guided activities.

- **Transportation**

Several respondents suggested that a shuttle system should be implemented in the park. Many respondents said that they would like a shuttle system that would transport hikers and visitors between visitor service areas and trailheads within the park. Other respondents favored a shuttle system that would transport visitors from areas outside of the park into the park. Participants also said that they would like the park to keep the red bus tours and to make them affordable for everyone.
- **Horses**

The majority of people who commented on horse use support public and private horseback riding facilities in the park. Most respondents expressed a desire for the park to expand the horse trail system and provide more horse facilities at campgrounds and trailheads. Several comments suggested that horse campgrounds and trails should be kept separate from general campgrounds and trails, and a few comments suggested eliminating horse traffic on trails.
- **Employee Housing**

Of the few comments received regarding employee housing, all stated it should be placed outside of the park and that no new employee housing should be constructed inside the park.
- **Campgrounds**

Comments received regarding campground facilities reflected various opinions. While some commenters said that campgrounds should remain primitive and that no additional RV sites should be added, the majority of commenters expressed a desire for campgrounds to be upgraded and expanded. Respondents suggested providing more services in campgrounds, allowing more sites for RVs, revegetating campgrounds between sites to provide privacy, and providing camping in additional areas of the park. Commenters also indicated that campground rates are too high and should be kept commensurate with facilities/services provided.
- **Chalets**

Various comments were received regarding chalets. Most of these comments supported the continued operation of chalets as they are now with the option of using Granite Park Chalet as a hiker shelter and Sperry Chalet as a full service lodging facility. However, some commenters supported repairing Granite Park Chalet as a full service chalet. A few respondents expressed concern about the impacts of chalets on wildlife and said that chalets should be phased out completely.
- **American Indians**

Comments stated that American Indians should be involved in park interpretation and commercial services. Commenters also wanted to ensure that local tribes would be allowed to use the park for religious and cultural purposes.
- **Length of Season**

While many commenters expressed concern that an extended park season would adversely impact wildlife, other respondents supported off-season use of the park. Many respondents suggested that existing roads should be groomed in the winter for cross-country skiing and snowshoeing. They also suggested that winterized day lodges should be operated in at least one location on the east

side of the park and one location on the west side of the park. One commenter also said that the park should be opened for therapeutic recreation programs during the winter.

- **Boats**
The majority of people who commented on boats said that they favor small-scale boat tours and the use of private boats on park lakes. Others suggested that limits should be placed on the amount of horsepower allowed in boats that can be used in motorized use areas and that the amount of guided float trips should be reduced.
- **Fishing**
One commenter said that lakes should be stocked with fish again.
- **Bicycling**
One commenter suggested that bicycle accessibility should be maximized in developed areas.

The *Draft Commercial Services Plan and Draft Environmental Impact Statement* will be made available to the public for a 60-day review and comment period. Public open houses and hearings will be held. Public comments will be used to complete the *Final Commercial Services Plan and Final Environmental Impact Statement* and reach a decision in the Record of Decision.

AGENCY COORDINATION

Agency coordination is essential for the identification of potential environmental impacts of a project and its alternatives. It also provides information regarding other agency planning efforts and proposed plans for a project area that contributes to the analysis of cumulative impacts.

Agency coordination was accomplished through correspondence, telephone communication, and review of project-related materials. Letters were sent to the U. S. Fish and Wildlife Service, the Montana State Historic Preservation Officer, the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation, and the Montana Department of Fish, Wildlife and Parks. Additional meetings, review and discussion have occurred with the U.S. Fish and Wildlife Service and the State Historic Preservation Office. All written correspondence received to date is contained in Appendix 5.

RECIPIENTS OF THE *DRAFT COMMERCIAL SERVICES PLAN AND DRAFT ENVIRONMENTAL IMPACT STATEMENT*

Elected Officials

Max Baucus, United States Senate
Conrad Burns, United States Senate
Flathead County Commissioners
Glacier County Commissioners
Judy Martz, Governor of Montana
Fred Matt, Chair, Confederated Salish and Kootenai Tribal Council
James St. Goddard, Acting Chair, Blackfeet Tribal Business Council
Dennis Rehberg, United States House of Representatives

Federal Agencies

Department of Interior, Office of the Solicitor
Flathead National Forest
Kootenai National Forest, USDA, Supervisor's Office
Lewis and Clark National Forest
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
Advisory Council on Historic Preservation

Canadian Government Agencies

Waterton Lakes National Park

State and Provincial Agencies

Montana State Historic Preservation Office
Montana State Clearinghouse
Montana Department of Fish, Wildlife and Parks

Organizations

Anti-Cruelty Society
Back Country Horsemen
Browning Public County Library
Coalition for Canyon Preservation
Columbia Falls Branch Library
Cut Bank Library
Flathead Conventions Bureau
Flathead County Library
Flathead Economic Development Corporation
Friends of the Bitterroot
Glacier Country Regional Tourism Commission
Glacier Natural History Association
Glacier Park Associates
Glacier Park Foundation
Glacier-Waterton Visitor Association
Great Falls Public Library
Great Falls Tribune

Missoula Public Library
 Montana Wilderness Association
 Montanans for Multiple Use
 National Parks Conservation Association
 Partners in Parks
 Trust for Public Lands
 Whitefish Branch Public Library
 Wild Wilderness
 Wilderness Society, Northern Rockies Regional Office

Concessioners

Belton Chalets, Inc.
 Glacier Park Boat Company
 Glacier Park, Inc.
 Glacier Wilderness Guides, Inc.
 Mule Shoe Outfitters, LLC
 Sun Tours
 Waterton Inter-Nation Shoreline Cruise Company, Ltd.

A complete listing of agencies, organizations, public officials, and individuals who received a copy of the *Draft CSP and Draft EIS* is on file at Glacier National Park.

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References



Appendix 1

Background Information for Necessary and Appropriate Commercial Services

Necessary and Appropriate Commercial Services

All commercial services operating within Glacier National Park must meet the definition of “necessary and appropriate.” What constitutes necessary and appropriate is determined by the park and based upon the National Park Service Organic Act, the park purpose and significance and the park’s General Management Plan.

Below is a description of the “necessary and appropriate” criteria used. This criteria was developed by Glacier National Park.

Criteria 1: The term “necessary” is defined for Glacier National Park as meeting one or more of the following:

1. Contributes to visitor understanding and appreciation of park purpose and significance.
2. Enhances visitor experiences consistent with park area philosophies.
3. Assists the park in managing visitor use and educating park visitors.
4. Is an essential service or facility not available within a reasonable distance from the park.

Criteria 2: The term “appropriate” is defined for Glacier National Park as meeting *all* of the following:

1. Services are consistent with the purpose and significance of Glacier National Park.
2. Services are consistent with laws, regulations, and policies applicable to Waterton-Glacier International Peace Park and the National Park Service.
3. Services do not compromise public health and safety.
4. Services do not significantly impact or impair park resources or values.
5. Services do not unduly conflict with other park uses and activities.
6. Services do not exclude the general public from participating in limited recreational opportunities.

TABLE 1. COMMERCIAL SERVICES CONSIDERED

X indicates that the service would meet that element of the criteria.

* indicates that the service would meet that element under specific conditions.

Current Commercial Services	Criteria 1: Necessary				Criteria 2: Appropriate						N & A Services for the Park	
	1	2	3	4	1	2	3	4	5	6	Yes	No
Lodging	X	X	X		X	X	X	*	X	X	X	
Retail/Vending/ATM	X	X	X	X	X	X	X	X	X	X	X	
Food/Beverage/Catering Meals				X	X	X	X	X	X	X	X	
Equipment Rentals	X	X	X	X	X	X	X	X	X	X	X	
Boat Tours	X	X	X		X	X	X	X	X	X	X	
Horse Packing Services	X	X	X		X	X	X	X	X	X	X	
Public Showers				X	X	X	X	X	X	X	X	
Public Laundry				X	X	X	X	X	X	X	X	
Emergency Road Services			X	X	X	X	X	X	X	X	X	
Guided Hiking	X	X	X		X	X	X	X	X	X	X	
Guided Cross-country Skiing/Snowshoeing	X	X	X		X	X	X	X	X	X	X	
Guided Bicycle Tours	X	X	X		X	X	*	X	*	X	X	
Guided Overnight Backpacking	X	X	X		X	X	X	X	X	X	X	
Guided Photography Workshops	X	X	X		X	X	X	X	X	X	X	
Guided Art Seminars	X	X	X		X	X	X	X	X	X	X	
Guided Horseback Riding	X	X	X	*	X	X	X	X	X	X	X	
Guided Interpretive Vehicle Tours and Public Transportation	X	X	X	X	X	X	X	X	X	X	X	

Potential Commercial Services	Criteria 1: Necessary				Criteria 2: Appropriate						N & A Services for the Park	
	1	2	3	4	1	2	3	4	5	6	Yes	No
Guided Rock Climbing	X		X		X		X	X	X	X		X
Guided Ice Climbing	X		X		X		X	X	X	X		X
Guided Natural and Cultural History Hikes	X	X	X		X	X	X	*	X	X	X	
Guiding Fishing Trips	*	*			X		X		X	X		X
Guided Underwater Diving	X	X	X		X	X	X	X	X	X	X	
Guided Rafting	X	X	X		X	X	X	X	X	X	X	
Step-on Guide Service	X	X	X		X	X	X	X	X	X	X	
Guided Motorcycle Tours		X			X	X	X	X	X	X	X	
Commercial Instruction (skill or technique based instruction)	*	*	*	*								X
Firewood Sales		X	X		X	X	X	*	X	X	X	
Personal Services (barbers, beauty salon, massage)	*	*	*	*								X
Crystal Reading												X
Child Care		X		X	X	X	X	X	X	X	X	
Kennels			X	X		X	*	*	*	X		X
Horse Boarding		X	X		X	X	X	*	*	X	X	
Marina Services					X	X	X	*	X	X		X
Boat Transportation (water taxi)		X	X		X	X	X	X	X	X	X	
Private Vehicle Shuttle		X	X		X	X	X	X	X	X	X	
Gas Stations						X	X		X	X		X
Taxi Services		X	X	X	X	X	X	X	X	X	X	
Horse Drawn Carriage (guided)	X	X	X		X	*	*	X		X		X
Horse Drawn Sleigh (guided)	X	X	X		X	*	*	X		X		X
Guided Dog Sleds	X	X	X		X		X		X	X		X
Institutions and Agencies That Do Not Qualify for Fee Waivers (Glacier Natural History Association and Glacier Institute)	X	X	X		X	X	X	X	X	X	X	
Commercial Entertainment Offered Within Concession Facilities (plays, movies, concerts)**	X	X			*	X	X	X	X	X	X	
Employee Support Facilities and Services				X	X	X	X	X	X	X	X	

**Commercial entertainment outside concession facilities and other special events would be regulated by management policies and special use permit requirements.

Current Commercial Services

- Lodging**

In some locations, lodging in the park is necessary to meet basic needs for overnight accommodations within a reasonable distance of park activities. Lodging facilitates and complements the visitor experience. Perpetuating lodging in existing lodging facilities assists with the preservation of the historic landmark and national register properties and meets the goals of the General Management Plan by continuing traditional services.

Lodging in the park is consistent with the park purpose of providing for the public benefit and enjoyment of the park. Providing lodging within the park is consistent with NPS policy. Lodging services do not compromise public safety or public health and do not significantly impact park resources beyond approved park development areas. Lodging services do not conflict with other park uses, and they do not limit recreational opportunities of the general public.
- Retail (including vending and automatic teller machines)**

Camp stores and gift shops located within a reasonable distance of park activities are necessary for park visitors to obtain food and basic items they need to enjoy the park. Gifts, souvenirs and other merchandise

are necessary if they enhance visitor understanding and appreciation of the park mission and values and complement the fundamental experiences of the park. Information tags on merchandise foster awareness about park resources and values. Souvenirs provide tangible keepsakes to remind visitors of their visit to the park so that they do not feel the need to take home a natural object or artifact that is part of the park fabric.

Sales of food and basic camping supplies are consistent with park policy and promote visitor well-being and enhance visitor's enjoyment of the park. These services do not significantly impact park resources or values and do not conflict with other park uses. These services do not adversely affect recreational opportunities in the park.

- Food and Beverage (including catering of meals)

Food and beverage services are necessary so park visitors and residents can meet their basic needs within a reasonable distance of park activities.

Food and beverage services are appropriate for the benefit of the public while they enjoy the park. These services are consistent with NPS policy, and they promote public well-being. Park resources and values are not significantly impacted by these services, and they do not conflict with other park uses. These services do not limit recreational opportunities for the public.

- Equipment Rental

Each type of rental equipment must be evaluated against the necessary and appropriate criteria on a case-by-case basis. Limited rental of items such as fishing and backpacking equipment can help facilitate visitor experiences in the park and contribute to the public's appreciation of park resources. In some cases, this type of equipment is not available within a reasonable distance from the park.

These services can be consistent with park purpose and policies. They may help promote public health and safety. Making the equipment available to the park may help protect park resources by educating the public on appropriate methods or "leave no trace" ethics. Most equipment rental services do not conflict with other park uses and may enhance recreational opportunities for the public. Bicycle rentals would not be provided in the park because they could conflict with public safety or impact park resources.

- Boat Tours

Interpretive services offered by boat tours help the visitor to understand and appreciate park resources. The services are consistent with park area philosophies as currently provided. The tours provide another avenue for the public to access remote areas. The services are consistent with all six of the appropriate criteria.

- Horse Packing Services

Packing services, particularly for drop trips into the backcountry, can enhance a visitor's experience or, for visitors who cannot carry all their own supplies, provide the opportunity to experience the backcountry. Packing services can assist the park in managing visitor use by delivering supplies where needed such as to the backcountry chalets. This service can be managed to meet all the appropriate criteria. Management actions would include limits on trails on which stock are allowed.

- Public Showers and Laundry Facilities

Showers and laundry facilities are necessary since they complement fundamental experiences of visitors. Hiking and camping are encouraged, and visitors need to occasionally clean up. Since there are very limited public shower facilities available outside the park and since available facilities are a considerable distance from the park, these services are necessary in the park. These services are appropriate since they promote public health and well-being. These facilities do not impact park resources beyond what is approved in park management plans. They do not conflict with other park uses.

- Emergency Road Services

Most of the park's visitors access the park by private vehicle. Lockout, towing, and repair services are frequently needed to move people through the park and prevent the abandonment of private vehicles. These services are essential for the visiting public and can be managed to meet all of the appropriate criteria.

- Guided Activities — General Elements

In general, most guided activities meet three of the necessary criteria. They enhance visitors' appreciation of park values through education of small groups of visitors by a knowledgeable guide. They facilitate and complement the fundamental experiences of park visitors through the enhancement of a quality park experience. Guided activities conform to the park's interpreter standards. A guide can provide a more in-depth educational experience than the visitors might gain through reading materials. In addition, a guide can provide an increased margin of safety for those wanting to participate in more adventurous recreational activities. Guides can provide an in-depth "leave no trace" educational experience that teaches skills that can be used in the future in this and other natural areas.

In general, most guided activities are appropriate since they are consistent with the purposes and values for which Glacier National Park was established. They provide enhanced opportunities for visitors to enjoy the park, while teaching skills to leave the park unimpaired for future generations. These services are consistent with NPS policy. These services do not compromise the public's well-being, and in many cases they enhance the visitors' margin of safety. Guided activities do not significantly impact park resources and should teach skills that will result in fewer impacts. These services should not unduly conflict with other park uses. Limits on commercial group sizes and the locations allowed for their activities prevent limited recreational opportunities from being monopolized by commercial parties.

Each guided activity must be considered on its own merits. Some were found to only **meet two** of the "necessary" criteria and some failed to meet all of the "appropriate" criteria. Each current guided activity is discussed below.

- Guided Hiking
This service meets three of the necessary criteria and all of the appropriate criteria as discussed above.
- Guided Cross-country Skiing/Snowshoeing
This service meets three of the necessary criteria and all of the appropriate criteria as discussed above.
- Guided Bicycle Tours
This service meets three of the necessary criteria as discussed above. Within certain perimeters, these services would meet all of the appropriate criteria. Roadways in the park, particularly the Going-to-the-Sun Road, are narrow with little or no room for bike lanes and with steep drop offs. The Going-to-the-Sun Road is primarily recognized as a motor vehicle roadway. Restrictions on bicycle travel to certain times of the day and conditions for bicycle tours would need to be considered to allow this service to meet appropriate criteria 3 and 5.
- Guided Overnight Backpacking
This service meets three of the necessary criteria and all of the appropriate criteria as discussed above.
- Guided Photography Workshops
This service meets three of the necessary criteria and all of the appropriate criteria as discussed above.
- Guided Art Seminars
This service meets three of the necessary criteria and all of the appropriate criteria as discussed above.
- Guided Horseback Riding
This service meets three of the necessary criteria and all of the appropriate criteria as discussed above. Similar services are available in close proximity of the park but not within the park.
- Guided Interpretive Vehicle Tours and Public Transportation
Public transportation and interpretive vehicle tours are necessary to facilitate the fundamental experiences for park visitors who do not have their own transportation to get to the park or choose to

learn about the park through other sources. Shuttle services between trailheads and other destinations within the park enable visitors to conveniently access major points of interest.

- Public transportation and interpretive vehicle tours are appropriate because they benefit the public by increasing opportunities to enjoy the park. These services are consistent with NPS policy. The services reduce crowding on park roads, enhance visitors' experiences through interpretation opportunities, simplify getting around the park, and make it easier and convenient to view park features. These services would reduce impacts on park resources due to fewer vehicles on the roads and reduced need for parking spaces at popular pull offs. Scenic values would be less impacted with fewer vehicles in the park. These services would not conflict with other park uses, and would compliment public transportation systems outside the park. Recreational opportunities would be enhanced due to simple shuttle logistics for hikers and boaters.
- Guided Rock Climbing
This service would fail to meet the appropriate criteria 2. Commercially guided off-trail travel is prohibited in the backcountry zone of the park, where rock climbing activities would likely occur. For this reason and for reasons of safety, this service is not considered to meet the necessary and appropriate criteria.
- Guided Ice Climbing
This service would fail to meet the appropriate criteria 2. Commercially guided off-trail travel is prohibited in the backcountry zone of the park, where ice climbing activities would likely occur. For this reason and for reasons of safety, this service is not considered to meet the necessary and appropriate criteria.
- Guided Natural and Cultural History Hikes
This service meets three of the necessary criteria and could be managed to meet all of the appropriate criteria as discussed under general guided activities.
- Guided Fishing Trips
This service would fail to meet the appropriate criteria 2 and 4. Commercially guided fishing increases the chances for mortality of protected species. Promoting guided fishing trips as a commercial activity would affect policies established with Waterton Lakes National Park.
- Guided Underwater Diving
This service meets three of the necessary criteria and all of the appropriate criteria as discussed under general guided activities.
- Guided Rafting
This service meets three of the necessary criteria and all of the appropriate criteria as discussed under general guided activities.
- Step-on Guide Services
This service meets three of the necessary criteria and all of the appropriate criteria as discussed under general guided activities.
- Guided Motorcycle Tours
This service meets one of the necessary and all of the appropriate criteria discussed under general guided activities.

Other Potential Commercial Services

- **Commercial Instruction (skill-based or technique-based instruction)**
This service fails to meet the necessary criteria because its focus is to teach skills and it is not focused on park values or enhancing understanding or appreciation of the park. These services would not be considered necessary and appropriate for provision in the park.
- **Firewood Sales**
This service meets two of the necessary criteria and all of the appropriate criteria. Sale of firewood helps to control the collection of dead and down firewood or the cutting of vegetation, thereby helping to preserve habitat. The service helps to facilitate campfires, which have been a traditional camping activity in national parks. This service would be considered appropriate as long as campfires are considered appropriate (for example, if analysis of air quality were to necessitate management action to ban campfires, then the sale of firewood would no longer be deemed appropriate).
- **Personal Services (beauty shops, barber, massage)**
These services fail to meet the necessary criteria and therefore are not considered necessary and appropriate services in the park.
- **Crystal Reading**
This service fails to meet the necessary criteria and therefore is not considered a necessary and appropriate service in the park.
- **Child Care (daily)**
The provision of child care would enable visitors to participate in a wider range of activities that may not be appropriate for all ages. These services are not readily available in the vicinity of the park. However, the licensing requirements for provision of these services may render them impractical or infeasible to provide. These services could be provided in a manner that met all of the appropriate criteria.
- **Kennels**
Many park visitors arrive in the park with pets, which are not allowed on park trails and in the backcountry. As kennel services are not readily available in the area, pet owners' options are to abstain from participating in park activities or to leave their pets in their vehicles. Provision of kennel services would assist the park in managing park use.
However, these services could not be managed to be consistent with the appropriate criteria. Concerns would include spread of disease to native species, noise and odors, and lack of an appropriate location that would not conflict with other park uses and activities. For these reasons, this service would not be considered a necessary and appropriate service in the park.
- **Horse Boarding**
Boarding of private horses (for one or two days) in preparation for accessing park trails and backcountry would enhance visitor experiences consistent with park philosophies and would assist the park in managing this visitor use.
These services could be managed to be consistent with the appropriate criteria. Concerns would include the length of stay, hay and feed that is free of noxious weed and seed, and restriction of the stock boarded to be disease free in order not to infect park stock and wildlife. This activity would occur only in existing stables run by concessioners.
- **Marina Services**
These services would not meet any of the appropriate criteria and would, therefore, not be considered as a necessary and appropriate service in the park.
- **Boat Transportation (water taxi)**
Public transportation by boat would enhance visitor experience by providing access to areas of the park and could assist the park in managing visitor use. This service could be managed to meet all of the appropriate criteria.

- **Private Vehicle Shuttle**
The shuttling of private vehicles from one trailhead or area of the park to another area would provide an alternative to a segment of public transportation. It would enhance visitor experience by helping to facilitate access to some areas of the park and could assist the park in managing visitor use. This service could be managed to meet all the appropriate criteria.
- **Gas Stations**
These services would not meet any of the appropriate criteria and would, therefore, not be considered as a necessary and appropriate service in the park.
- **Taxi Services**
Taxi services, if managed in a way that is consistent with the management area philosophies, could enhance visitor experience and assist the park in managing use by assisting with access. The service can supplement other limited public transportation services that are not readily available to all visitors. The service could be managed to be consistent with all of the appropriate criteria.
- **Horse Drawn Carriage**
These services could be provided in a manner that would enhance visitor experience, provide an educational opportunity to the public, and contribute to visitors' understanding and appreciation of the park if a strong interpretive element were included.

These services could not be managed to be consistent with the appropriate criteria. Concerns would include where the services would be provided and at what level. Use on roads that are open to the motor vehicles would be in conflict with park regulations and policies and would compromise public safety. The only remaining roads would not provide sufficient opportunity for the experience without impacting park resources or conflicting with other park uses. For these reasons, this service would not be determined to be necessary and appropriate in the park.

- **Horse Drawn Sleigh**
These services could be provided in a manner that would enhance visitor experiences, provide an educational opportunity to the public, and contribute to visitors' understanding and appreciation of the park if a strong interpretive element were included.

These services could not be managed to be consistent with the appropriate criteria. Concerns would include where the services are provided and at what level. Use on roads that are open to motor vehicles would be in conflict with park regulations and policies and would compromise public safety. Use on roads that are closed to vehicles would conflict with other park uses and activities, such as cross-country skiing and snowshoeing. For these reasons, this service would not be determined to be necessary and appropriate in the park.

- **Guided Dog Sled Services**
These services could be provided in a manner that would enhance visitor experiences, provide an educational opportunity to the public, and contribute to visitors' understanding and appreciation of the park if a strong interpretive element was included.

These services would not, however, be consistent with the appropriate criteria. Concerns would include where the services would be provided and at what level. Use on roads that are open to motor vehicles would be in conflict with park regulations and policies and would compromise public safety. Use on roads closed to vehicular traffic would conflict with regulations that prohibit dogs on trails and in the backcountry. For these reasons, this service would not be determined to be necessary and appropriate in the park.

- **Commercial Entertainment (plays, movies, concerts for fee within concessioner facilities)**
These services could be provided in a manner that would enhance visitor experiences and contribute to visitors' understanding and appreciation of the park if themed appropriately.

If themed appropriately to be consistent with the purpose and significance of the park, these services could be managed to be consistent with all the appropriate criteria. Concerns would include appropriate entertainment themes that would not conflict with other park uses and activities, including other concessioner services and interpretive programs.

- Employee Support Facilities and Services

Employee support facilities and services are necessary because of the distance to, expense and limited availability of out-of-park-housing. Most rental housing outside the park is not available on a short term basis, which seasonal employees require. Some employees work split shifts; others provide essential emergency response services and must be available 24 hours a day.

These services are appropriate since they are consistent with NPS policy, which allows concession employees essential to the management and operation of the park to live within the park. This service is consistent with the management of Glacier National Park. These facilities and services do not compromise public health or safety, and they enhance visitor well-being by allowing for efficient visitor services. These facilities do not significantly impact park resources since they are allowed in areas addressed by approved park plans. There are no undue conflicts with other uses of the park.

Appendix 2

Prescriptions and Standards for Necessary and Appropriate Commercial Services

Commercial services prescriptions and standards describe how to achieve the conditions outlined in the Commercial Services Statement for the park. They also describe the conditions to be attained for each of the services described in the section, “Necessary and Appropriate Services” in Chapter 2 Alternatives. These standards provide direction for specific areas within the park. They address visitor service and experience objectives concerning access, natural resources, cultural resources, facilities and maintenance.

The standards provide future *performance expectations* for each type of service and do not necessarily reflect what is currently available in the park. They are based on a comprehensive evaluation of commercial services and include consideration of opportunities beyond park boundaries.

PRESCRIPTIONS AND STANDARDS FOR NECESSARY AND APPROPRIATE COMMERCIAL SERVICES

Lodging Prescription

- Description
Budget to deluxe lodging is offered at prices affordable to a broad spectrum of visitors. Accommodations include budget cabins and hostel units, standard to deluxe motel and cabin units, standard to deluxe hotel units, and rustic backcountry chalet accommodations. A variety of accommodation types and price ranges are available.

Per the General Management Plan, a minimum of approximately 500 guest units will be maintained.

Most lodging within the park is open from June to October. Some accommodations are available from mid-May to October. Backcountry chalet accommodations are typically available from July through early September. No year-round accommodations are available in the park.

- *Budget* – Budget accommodations include housekeeping cabins without bathrooms and hostel accommodations with common bathrooms and shower facilities in close proximity. These accommodations provide only very basic amenities and provide for very basic visitor needs. Although the rooms are minimally or rustically furnished, guests are provided comfortable beds, bedding and linens with daily housekeeping services, and bathroom facilities. Prices vary, but are under \$50 per night (in 2001).
- *Standard* – Standard accommodations include rustic housekeeping cabins with private bathrooms, motel units and small hotel and small cabin units without lake views. All are comfortably furnished to complement park themes. All have private bathrooms. Amenities are basic and designed around meeting basic visitor needs. They may include in room phones. Standard rates range from \$50-100 per night (in 2001).
- *High* – High accommodations include motel units, cabins units, and hotel rooms. All are nicely furnished to complement park themes. All have private bathrooms. They tend to be more spacious and have lake views. Some have kitchens and/or additional rooms for sleeping or sitting. Amenities provide a higher level of guest comfort and may include items such as in room phones, cabling for computer linkups, alarm clocks, coffee makers, hair dryers, irons and ironing boards. High rates range from \$100-150 (in 2001).

- *Deluxe* – Deluxe accommodations are located in full service hotels or lodges. Furnishings are high quality and upscale. Rooms are furnished and accessorized to complement park themes. Additional rooms for sleeping or sitting may be included. All have private bathrooms and lake views. Special amenity packages are provided for guest comfort and convenience. Amenities may include in-room phones, cabling for computer linkups, alarm clocks, coffee makers, hair dryers, irons and ironing boards, microwave ovens, refrigerators, in room safes, honor bar, upscale personal amenity packages (soaps, etc.), and guest robes. Deluxe rates range upward from \$150 per night (in 2001).
- *Backcountry chalets* – Accommodations range from hiker shelter accommodations to full service chalets. Both include common bathrooms with no shower facilities available. Guests are encouraged to pack out what they bring into the chalets, particularly garbage.

Hiker shelters provide private rooms, beds with optional bedding, common cooking (including stove), and dining facilities. Guests must bring their own food, cooking supplies and water, although limited items are available for retail sale at the chalet. Hiker shelter rates vary but are under \$70 per person per night (in 2001).

Full service chalets include a private room and three meals prepared by staff. All bed linens are provided. Housekeeping services are provided. Guests must bring their own personal items. Rooms are modestly and rustically furnished in keeping with the backcountry and historic atmosphere of the chalets. Full service chalet rates range upwards of \$150 per person per night (in 2001).

- **Visitor Experience**
Visitors enjoy clean, comfortable, well maintained park lodging that complements the natural setting with opportunities to view wildlife and learn about the resources of the park. Visitors are well informed about accommodations and services available to them. The reservations services are efficient, informative, easy to access and accurate.
- **Standard/Expectation**
Lodging meets NPS standards and applicable health, life and safety codes, as well as ADA requirements. Reservation and front desk services are efficient, friendly and easily accessed. Housekeeping services are efficient, thorough and timely. Facilities are well maintained and cyclic maintenance programs are in place. Exterior design and color blend with the environment and historic districts. Interiors are compatible with area themes. Utilities are provided as appropriate in each developed area. Facilities are designed and located to minimize visual impacts. Sustainable design is used for any additional facilities. Facilities are managed and maintained to minimize resource impacts and conflicts with wildlife.

Although demand for accommodations in July and August sometimes exceeds available accommodations in the park, a range is available in communities surrounding the park within a one-hour drive.

Facilities are handicapped-accessible and services are available to accommodate visitors with special needs. Efforts are made to recycle and reduce solid waste, water, and energy consumption. Cleaning supplies are effective and safe for the environment, visitors and employees.

Retail Prescriptions (including vending and automatic teller machines)

- **Description**
Retail sales include grocery and convenience items as well as gifts, souvenirs, books, apparel, outdoor supplies, and gear and are available in each developed area to meet basic visitor needs. Each retail store has a mission statement with gifts and souvenirs relating to park themes. Merchandise varies from store to store with some merchandise specific to each location. Regionally hand-crafted and theme-related merchandise which is manufactured in the U.S.A. is preferred.

- **Visitor Experience**
Visitors are able to meet their essential and spontaneous needs for food and convenience items. Quality gifts, books, and souvenirs enhance visitors' enjoyment and understanding of the park. Visitors enjoy shopping in a pleasant, uncongested environment. Outdoor gear, supplies and apparel provide essentials for specific activities and changing weather. Merchandising decor and displays promote park and mission statement themes and provide information to park visitors to enhance their park experience.
- **Standard/Expectation**
Retail facilities are clean, well maintained and accessible to park visitors. Window and interior displays are attractive and emphasize park themes. Displays, tags and labels interpret park resources and park themes. Facilities complement the area in which they are located. Corporate advertisement on vending machines is discrete. Vending machines outside of facilities or in public areas are located, screened and sized to limit the impact on the historic setting. Staffing is adequate, well informed about the park and area, and able to answer visitors' questions about the merchandise, visitor services and park resources. Services comply with applicable NPS regulations, U.S. Public Health Service requirements and Montana liquor laws. Grocery items are sold in suitable sizes to meet the needs of campground users as well as day use visitors. Post consumer recycled products will be featured where possible. Camp stores carry hot and cold beverages and many ready-to-eat items. Fresh produce, meat, baked goods, other grocery items, firewood, ice, and outdoor supplies meet visitor needs for picnics, snacks, and meal preparation during extended stays. Merchandise is high quality, fairly priced and available in a range of prices. Food storage and waste are managed to reduce wildlife conflicts. Appropriate recycling will occur.

Food and Beverage Prescription

- **Description**
Food and beverage service provides for visitor needs in a pleasant setting and are complementary to the type of accommodations in the same developed area. A range of types and prices of food service is available from fast food/takeout to full service dining to catered meals. Options are included for children, vegetarians, and others with special dietary needs or preferences. Quality food is offered at a price that is reasonable for the type of dining experience.
 - *Fast food/take out* – Fast food includes self-service, counter service, cafeteria, or take-out. It is quick service at low cost from a limited menu of items such as sandwiches, hot dogs, snacks, deli items, and beverages. Dining can be on premises or off premises.
 - *Family Dining* – Family dining provides moderately priced meals prepared to order and served by wait staff on premises. The menu includes a variety of entrees and side dishes, many reflective of regional themes. Family-oriented dining facilities provide children's menu, highchairs, and booster seats. Table service could be paper or linen. Alcoholic beverages in an affordable price range may be available.
 - *Full Service Dining* – Full service dining is distinguished by meals prepared to order and served by trained wait staff. Facilities and atmosphere offer a higher level of comfort and amenities such as linen tablecloths and napkins, glassware, and upgraded table and flatware. Dining room decor, furnishings, table decorations, linens, and quality table service create an upper scale atmosphere and enhance park themes. Creative menus are unique to each establishment. A full range of appetizers, salads, entrees, and desserts is distinctively presented. Many items reflect regional themes. A full range of alcoholic beverages at a range of prices is available. Prices are moderate to high-end, in line with comparable full or fine dining restaurants outside the park.

At some locations, full service lounges/bars are associated with dining rooms and food service. Lounges offer appetizer and light menu options.
 - *Catered meal service* – Catered meal services include special food and beverage services for special events or activities held within concessions facilities or at designated picnic areas. These activities can include weddings, conventions, and meetings. Although commercial in nature, they are provided to a specific group with customized needs, *not the general public*. Menus are developed around the

customer's needs and may range from buffet to full, sit-down service. Alcoholic beverage services may be provided. Catered food and beverage services within concession facilities are provided by a concessioner under the terms of a concession authorization. Rates for these services are approved by the National Park Service as for other services. Catered food and beverage services at designated picnic areas are authorized under the terms and conditions of a Special Use Permit.

- **Visitor Experience**
Visitors enjoy quality food in reasonable portions at a price range suitable to the type of dining experience. The level of service corresponds to the type of eating establishment but is always friendly and efficient. The needs of children and visitors with special dietary needs are met.
- **Standard/Expectation**
Quality food service complies with applicable NPS and Public Health Service requirements, ADA standards, and Montana Liquor Laws. Smoking is permitted only in designated areas. Solid waste is minimized and every effort is made to conserve energy, water and promote recycling. All cleaning supplies are effective and safe for the environment, visitors and employees. Menus are approved by the National Park Service. Food storage and waste are managed to reduce wildlife conflicts and prevent impacts to park utility systems.

Equipment Rental Prescription

- **Description**
Rental equipment is available in specific developed areas of the park. Equipment includes, but is not limited to fishing and backpacking gear and small boat and canoe rentals. Other equipment rentals must be evaluated against necessary and appropriate criteria.
- **Visitor Experience**
Limited rental equipment allows visitors to participate in activities for which they would otherwise be unequipped. Renters receive instruction on proper use of the equipment.
- **Standard/Expectation**
All equipment is in good operating condition. The amount and type of rental equipment are consistent with the developed area philosophies, necessary and appropriate criteria, and any identified capacities.

Boat Tours Prescription

- **Descriptions**
Through a scenic boat tour, visitors gain a different perspective of the park. A skilled guide and/or boat captain provides visitors with quality interpretation of park resources.
- **Visitor Experience**
Visitors participate in safe, enjoyable trips on safe, clean, comfortable, well maintained boats. They gain a deeper understanding and appreciation of park resources in the company of a skilled guide. Visitors may have opportunities to view wildlife in their natural habitat, without disturbing, harassing, or enticing them.
- **Standard/Expectation**
Approved life vests are available in a range of sizes. Services are provided in accordance with U.S. Coast Guard standards. Guides/captains effectively promote a deeper understanding and appreciation of the park. They are currently certified in first aid and cardiopulmonary resuscitation (CPR).

Horse Packing Services Prescription

- **Descriptions**
Packing services deliver supplies to backcountry campsites and chalets through the use of horses and other pack animals.
- **Visitor Experience**
Visitors arrange for their camping equipment and supplies to be delivered and retrieved by stock to and from

designated backcountry campsites. Visitors enjoy the services provided at the two backcountry chalets which are supplied by pack stock.

- **Standard/Expectation**
Prearranged delivery and retrieval of supplies to either the chalets or backcountry campsites is provided by healthy, well cared-for stock. Pack trains are sized appropriately for the terrain with adequate control by an experienced packer/wrangler. Stock loads are appropriate for the type of stock and the terrain. Drop trip packing is provided only to backcountry locations approved for stock travel. Stock does not overnight on the trail but returns to base each day. Stock trucks or horse trailers and vehicles are well maintained and meet all applicable standards.

Public Showers and Laundry Prescription

- **Descriptions**
Public showers and laundry facilities may be available at developed areas of the park.
- **Visitor Experience**
Visitors are able to take care of basic personal hygiene without leaving the park. These facilities are particularly appropriate for visitors who are on extended stays and/or are participating in activities under primitive conditions.
- **Standard/Expectation**
Facilities are clean, well maintained, available at appropriate hours, adequately staffed and carry appropriate supplies for the function.

Emergency Road Services Prescription

- **Descriptions**
Emergency road services provide visitors with assistance for vehicle problems and towing services within the park.
- **Visitor Experience**
Visitors have access to services ranging from lock-out, emergency repairs, and towing when they have vehicle problems in the park.
- **Standard/Expectation**
Operators are qualified professionals, licensed to provide emergency road services, locksmith services and towing. Vehicles are well maintained and equipped to safely perform the services and meet all applicable standards. Visitors have access to emergency road services that meet their needs for affiliation with organizations such as American Automobile Association, Good Sam, etc.

Guided Activities General Prescription

- **Descriptions**
A variety of guided activities is available for visitors. Guided activities include hiking, backpacking, cross-country skiing, snowshoeing, bicycle tours, photography workshops, art seminars, horseback riding, road-based interpretive vehicle tours, and transportation (including step-on guide service), birding, fishing, underwater diving, and rafting. Interpretive programs are provided as a part of all guided activities.
- **Visitor Experience**
A knowledgeable guide enables visitors to enjoy a specialized experience, which they would not otherwise be able to enjoy due to lack of equipment, experience, and/or knowledge.
- **Standard/Expectation**
Resource impacts are minimal. Guide-to-client ratio and party size are appropriate for each activity. Guides are trained in first aid and CPR and are able to provide information on park resources and answer visitors' questions accurately. All guides are well trained, professional and friendly. All equipment provided including stock, vehicles and gear is well maintained in serviceable condition. All NPS, U.S. Environmental

Protection Agency (EPA), and Public Health Service requirements are met or exceeded. Professionally presented interpretation supports park policies and assists the National Park Service in educating visitors in safety, stewardship, and resource protection. Interpretation fosters an appreciation and understanding of the park.

Guided Hiking Prescription (natural and cultural history and recreational)

- **Description**
Guided hiking on trails allows visitors to have enhanced experiences in the backcountry of Glacier that focus on an appreciation and understanding of natural and cultural resources, while utilizing “Leave-No-Trace” (LNT) recreation ethics. Visitors are provided in-depth educational opportunities, in a manner consistent with bear safety guidelines, that minimizes disturbance to resources and other visitors, through experienced guides with strong interpretive skills. Meals may be provided.
- **Visitor Experience**
Visitors participate in single day trips within the Day Use and Backcountry Zones in the park. The focus is on learning about park resources, natural processes, and/or cultural resources and enjoying all the benefits that Glacier’s backcountry provides. Visitors should end their trip with a better understanding and appreciation of park resources, and how to visit the backcountry of Glacier safely, without leaving a lasting impact. Fishing and photography are incidental to the trip, not the main focus of the guided experience.
- **Standard/Expectation**
Guides are knowledgeable of the resources, patient and friendly, and support wildland preservation values. They are trained in LNT, certified in CPR and first aid, and knowledgeable of the safety precautions for recreating in wildland areas where inclement weather, bears, and other dangers are present. Group sizes and guide/client ratios are intended to provide a quality experience that does not adversely affect other visitors or natural resources. Off-trail hiking does not occur. Support vehicles are clean, comfortable, and well maintained. Quality food is provided.

Guided Backpacking Prescription

- **Description**
Guided backpacking along trails allows visitors to have enhanced, overnight experiences in the backcountry of Glacier that focus on an appreciation and understanding of natural and cultural resources, while utilizing “Leave-No-Trace” (LNT) recreation ethics. Visitors are provided in-depth educational opportunities, in a manner consistent with bear safety guidelines, that minimizes disturbance to resources and other visitors, through experienced guides with strong interpretive skills. Equipment, meals, and sherpa services may be provided.
- **Visitor Experience**
Visitors participate in multi-day trips within the Day Use and Backcountry Zones in the park. The focus is on learning about park resources, natural processes, and cultural resources and enjoying all the benefits that Glacier’s backcountry provides. Visitors should end their trip with a better understanding and appreciation of park resources, and how to visit the backcountry of Glacier safely, without leaving a lasting impact. Fishing and photography are incidental to the trip, not the main focus of the guided experience.
- **Standard/Expectation**
Guides are knowledgeable of the resources, patient and friendly, and support wildland preservation values. They are trained in LNT, certified in CPR and first aid, and knowledgeable of the safety precautions for recreating in wildland areas where inclement weather, bears, and other dangers are present. Group sizes and guide/client ratios are intended to provide a quality experience that does not adversely affect other visitors or natural resources. Off-trail hiking does not occur. Support vehicles are clean, comfortable, and well maintained. All equipment is appropriate, well maintained, and meets LNT guidelines. Quality food is provided.

Guided Cross-Country Skiing and Snowshoeing Prescription

- **Descriptions**
Guided cross-country ski and snowshoe tours include both day tours and overnight tours. The purpose of the tours is to allow small parties of visitors to experience the backcountry of the park in a way that focuses on an appreciation of the park values, natural processes and “leave no trace” techniques. Skilled guides interpret the resources of the park and provide assistance as necessary.
- **Visitor Experience**
Visitors participate in safe, enjoyable Nordic ski and snowshoe trips using gear obtained outside the park. Equipment provided by the operator is well maintained, late-model ski gear. Visitors gain a deeper understanding and appreciation of the park resources in the company of a skilled guide.
- **Standard/Expectation**
Support vehicles are clean, comfortable, and well maintained. All National Park Service and Environmental Protection Agency standards are met or exceeded. All participants are equipped with well maintained, up to date equipment and properly equipped with suitable supplies and protective gear in anticipation of staying out overnight in inclement weather. Guides are skilled skiers, knowledgeable of winter survival skills, certified in avalanche awareness, first aid and CPR, and are able to interpret park resources and accurately answer visitors’ questions.

Guided Bicycle Tours Prescription

- **Descriptions**
Guided bicycle tours are conducted on specific roadways in Glacier National Park. Off-road travel is not permitted. These tours travel through the park. One day or multiple-day tours are provided. A skilled leader interprets natural and cultural resources of the park and assists participants as needed.
- **Visitor Experience**
Visitors participate in safe, enjoyable trips on well maintained, properly equipped bicycles. They gain a deeper understanding and appreciation of park resources in the company of a skilled tour guide.
- **Standard/Expectation**
Support vans are clean, comfortable and well maintained. All NPS and EPA standards are met or exceeded. Bicycles are well maintained, and properly equipped. Helmets are required and other safety equipment is available. Tour guides are certified in first aid and CPR. Participants adhere to restrictions for bicycle use in the park and safety conditions such as riding single file and using pull outs to allow traffic to pass.

Guided Photography Workshops/Tours and Art Seminars Prescription

- **Description**
Photography and art tours or seminars are specialized programs, which include some instruction in a creative field. The focus of the park portion of the activity is not for instruction purposes but for use of the skills learned elsewhere to capture images of park resources. These tours are led by a guide who possesses particular artistic skills.
- **Visitor Experience**
Visitors have the opportunity to exercise skills to capture images of park resources.
- **Standard/Expectation**
Instructors are skilled in their area of expertise. In cases where activities occur off roadways, instructors are certified in first aid and CPR. Activities are not to occur off-trail or detract from recreational opportunities for other park visitors.

Guided Horseback Riding Prescription

- **Description**
Horseback rides take visitors on park trails under the supervision of a trained guide.

- **Visitor Experience**
Visitors participate in a safe, enjoyable guided horseback ride with the opportunity to participate in a traditional western activity on park trails. A variety of tour lengths provides opportunities for a variety of skill levels. Horseback transportation provides access to backcountry chalets and other remote areas of the park.
- **Standard/Expectation**
Resource impacts are minimized. Group size and guide-to-client ratio is appropriate for the area and activity. Stock is suitable for the terrain and the experience level of the riders, and is well cared-for and maintained. Guides/wranglers are experienced with stock handling. Guides are certified in CPR and first aid. Safety education of the clients and attention to safe operational practices is adhered to by the employees. Feed and waste are managed to prevent conflicts with wildlife and to keep odors to a minimum. Potential conflicts with hikers are managed by designating specific trails for commercial horse use, sharing information with the public on which trails are designated for horse use, and limiting party size. Trips include appropriate interpretation of park resources.

Guided Interpretive Vehicle Tours (natural and cultural) and Public Transportation Prescription

- **Description**
Interpretive vehicle tours (road-based tours) and public transportation are conducted on all primary roads in the park with the exception of the inside North Fork Road. Historic “red buses,” in addition to other types of vehicles, are used to provide interpretive tours of the park. A skilled tour guide interprets natural and cultural resources of the park. Other public transportation services (such as shuttle buses, taxis and private car shuttling) are provided to assist visitors with point to point travel within the park.
- **Visitor Experience**
Visitors participate in safe, enjoyable trips in safe, clean, comfortable vehicles. They gain a deeper understanding and appreciation of the park resources in the company of a skilled tour guide. Convenient, reliable, and affordable point-to-point transportation services allow visitors to access destinations within the park without driving their own vehicles.
- **Standard/Expectation**
Tour guides and drivers are certified in first aid and CPR and are trained to safely operate the vehicles being used. Tour guides and drivers are trained to accurately share information about the park and to answer visitors’ questions.

Guided Underwater Diving Prescription

- **Description**
Guided underwater diving allows park visitors, who are already fully certified divers, to experience the underwater natural and cultural resources of the park under the supervision of a skilled, knowledgeable guide.
- **Visitor Experience**
Visitors experience the underwater natural and cultural resources of the park and gain a deeper understanding of the park’s history and environment. Skilled interpretation of the area is provided by knowledgeable guides.
- **Standard/Expectation**
Diving instruction is not provided as part of this service. All participants are fully certified divers. Divers are properly equipped. Safe diving practices are adhered to. Skilled diving instructor/guides provide accurate interpretation of the park resources. Guides are knowledgeable about the protection of underwater resources and promote responsible practices with their clients toward this end. Guides are certified in first aid and CPR.

Guided Rafting Prescription

Guided raft trips are available on the rivers surrounding Glacier National Park under the administration of the U.S. Forest Service.

Step-on Guide Services Prescription

- **Description**
Local interpretive guides are hired to ride along with vehicle tours (road-based tours) on the primary roads in the park, with the exception of the inside North Fork Road. This skilled tour guide interprets natural and cultural resources of the park.
- **Visitor Experience**
Visitors participate in informative, enjoyable tours in the comfort of their own tour vehicle. Tours are customized. A guide with in-depth knowledge of the local area is available to answer questions, provide information, and to help passengers gain a deeper understanding and appreciation of park resources.
- **Standard/Expectation**
Tour guides are certified in first aid and CPR, and are trained to accurately share information about the park and to answer visitors' questions.

Guided Motorcycle Tours Prescription

- **Description**
Guided motorcycle tours are conducted on specific roadways in Glacier National Park. Off-road travel is not permitted. These tours travel through the park. One day or multiple day tours are provided. A skilled leader interprets the natural and cultural resources of the park and assists the participants as needed.
- **Visitor Experience**
Visitors participate in safe, enjoyable trips on well-maintained, properly equipped motorcycles. They gain a deeper understanding of the park resources in the company of a skilled tour guide.
- **Standard/Experience**
Support vans are clean, comfortable and well maintained. All National Park Service and Environmental Protection Agency standards are met or exceeded. Motorcycles are well maintained and properly equipped. Helmets are required and other safety equipment is available. Tour guides are certified in first aid and CPR.

Firewood Sales Prescription

- **Description**
Firewood sales in the campgrounds provide a convenient source of firewood to campground users. The service helps eliminate the collection of dead and down wood and cutting of vegetation and helps protect habitat.
- **Visitor Experience**
Visitors are able to access firewood without traveling out of the campground.
- **Standard/Expectation**
Quality, dry firewood, collected outside the park boundaries, is made available to campground users. The service is available at reasonable cost and at convenient times to the users. The wood is packaged with burnable packaging to eliminate trash. Firewood sales in campgrounds do not prohibit the sale of firewood in camp stores elsewhere in the park.

Child Care Prescription

- **Description**
Drop-in child care services are provided by licensed operators to allow visitors to participate in daytime activities that are not appropriate for all ages.

- **Visitor Experience**
Visitors may leave their children in the care of a licensed provider in order to participate in hikes, horseback rides, or other activities that would not be appropriate for all ages.
- **Standard/Expectation**
Providers are appropriately licensed and staffed to provide daytime child care services. Facilities used for the service meet all applicable standards and provide a safe, pleasant environment for the children. All employees have appropriate credentials and experience and are adequately supervised. An efficient, easily accessed reservation system is in place to allow parents to plan ahead. All equipment, toys, and supplies are appropriate for the age of the children in the program. All employees are certified in first aid and child and adult CPR. All activities are age-appropriate, well supervised and safe for the children. All snacks and meals are appropriate and all licensing and Public Health Service standards are met.

Horse Boarding Prescription

- **Description**
Short-term stock boarding is available only at the Many Glacier stables as a mid point stay during a multi day backcountry stock trip.
- **Visitor Experience**
Visitors have access to a short-term (one or two day) stock boarding facility while on layover days when accessing specific trails and stock routes in the park, (ie. the Continental National Scenic Trail).
- **Standard/Expectation**
Facilities are clean, well maintained, and appropriate for the service. Operators are professional, knowledgeable and trained in the provision of these services. Stock being boarded must have veterinary certification that they are disease free. Only hay that is certified to be free of noxious weed seed and appropriate feed may be used. Feed storage and waste disposal are appropriate to avoid conflicts with wildlife. Animals are appropriately fed and cared for. Boarding is only short-term (one or two days) to allow for layover days or the start or end of the access to specific trails and stock routes in the park.

Boat Transportation Prescription

- **Description**
Boat transportation services provide visitors access to trailheads on lakes in the visitor services zones where appropriate.
- **Visitor Experience**
Visitors travel by boat to access lake trailheads and other designated locations.
- **Standard/Expectation**
Boats are safe, well maintained and appropriately sized for the service. Motors are sized appropriately. Operators are appropriately trained, knowledgeable, and licensed for the service. The service is only provided on lakes in the appropriate visitor service zones and to appropriate drop points. No boat transportation services are provided on lakes in the North Fork.

Private Vehicle Shuttle Prescription

- **Description**
This service provides shuttling of a visitor's private vehicle to specific trailhead destinations in the park. The shuttling facilitates hiking trips that do not require back tracking on trails to exit at the same point where the hike originated.
- **Visitor Experience**
Visitors arrange to have their private vehicle shuttled to a trailhead exit point.

- **Standard/Expectation**
Shuttle drivers are licensed and qualified to operate the visitors' vehicles. Shuttle vehicles are well maintained and meet all applicable standards.

Taxi Services Prescription

- **Description**
Taxi services provide a convenient way for visitors to access the park and their selected destinations. Taxi service is available from outside the park to destinations inside the park subject to limitations in the North Fork and on the upper sections of the Going-to-the-Sun Road.
- **Visitor Experience**
Visitors can prearrange to be delivered to and picked up at their selected destination within the park.
- **Standard/Expectation**
Taxi services are provided on a prearranged, on-demand basis. Vehicles are well maintained and meet applicable standards. Appropriate fees are paid upon entering the park. Service is subject to limitations in the North Fork and on the upper sections of the Going-to-the-Sun Road.

Commercial Entertainment Prescription

- **Description**
Commercial entertainment (concerts, plays, programs) related to the purpose and significance of Glacier National Park is provided to visitors in concession facilities.
- **Visitor Experience**
Visitors experience professional entertainment that deepens their understanding and appreciation of the park, its resources, and its history.
- **Standard/Expectation**
Fees are commensurate with the quality and type of the performance. Programs are related to park themes and contribute to the visitors' understanding and appreciation of the park. All performances occur within concessioner facilities.

Employee Support Facilities and Services Prescription

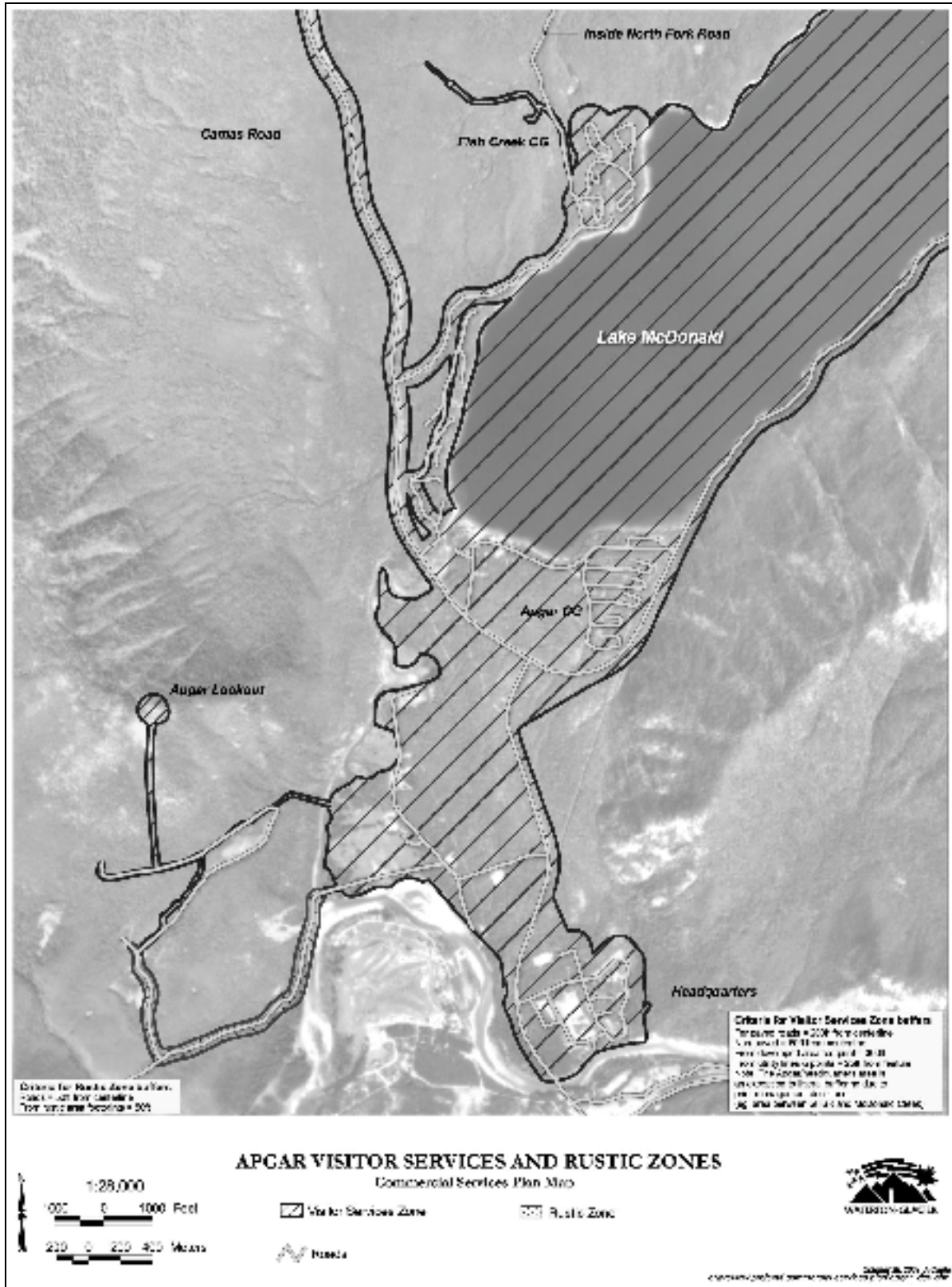
- **Description**
Administrative offices, employee housing and food service, employee recreation facilities, maintenance facilities, sites for construction contractors, and other support services are provided in the park. These facilities and services support public lodging, food service, retail stores, and other visitor recreational activity operations. Concessioners hire more than 700 seasonal employees who need food service and housing, in order to support concession operations. Housing is not readily available outside the park for seasonal staff, particularly on the east side of the park. Due to distance, expense, and limited availability of outside-park locations, most support services are located within park boundaries or in close proximity to the park.
- **Visitor Experience**
To achieve quality visitor service, the scope of commercial operations requires some level of support services and facilities within the park. These facilities are needed to house and feed a large number of employees with variable work shifts. These facilities enhance employee recruitment and retention resulting in a quality work force to provide visitor services. Support facilities also enable visitor services to be provided more efficiently.
- **Standard/Expectation**
All operations meet or exceed NPS and Public Health Service standards. Operations are well managed and adequately supervised. Quality employee housing, food service, and recreation programs ensure satisfactory living and working conditions. Administrative and other necessary support facilities ensure that commercial operations are efficiently managed and equipped to provide quality visitor services.

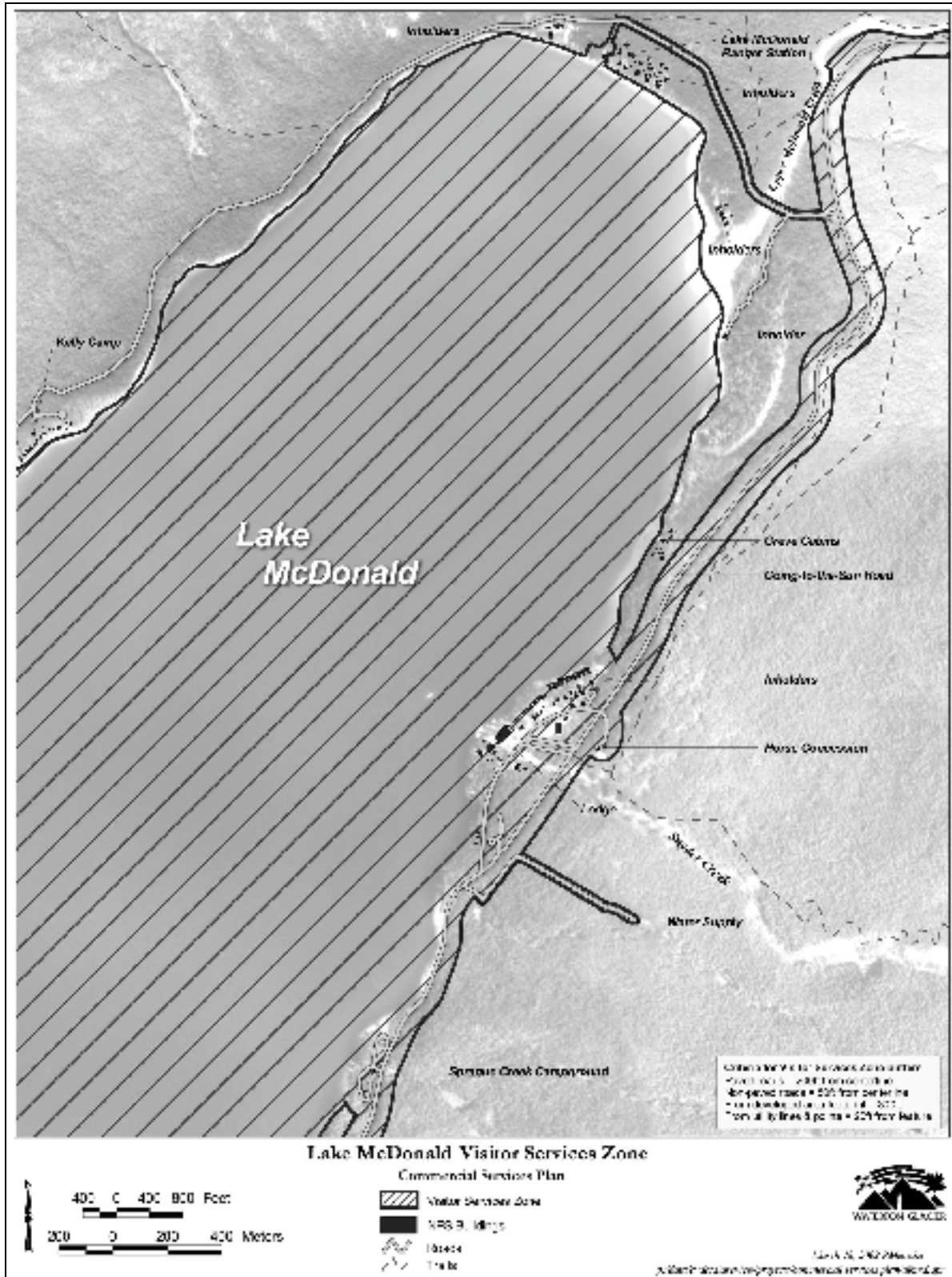
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Appendix 3 Management Zones

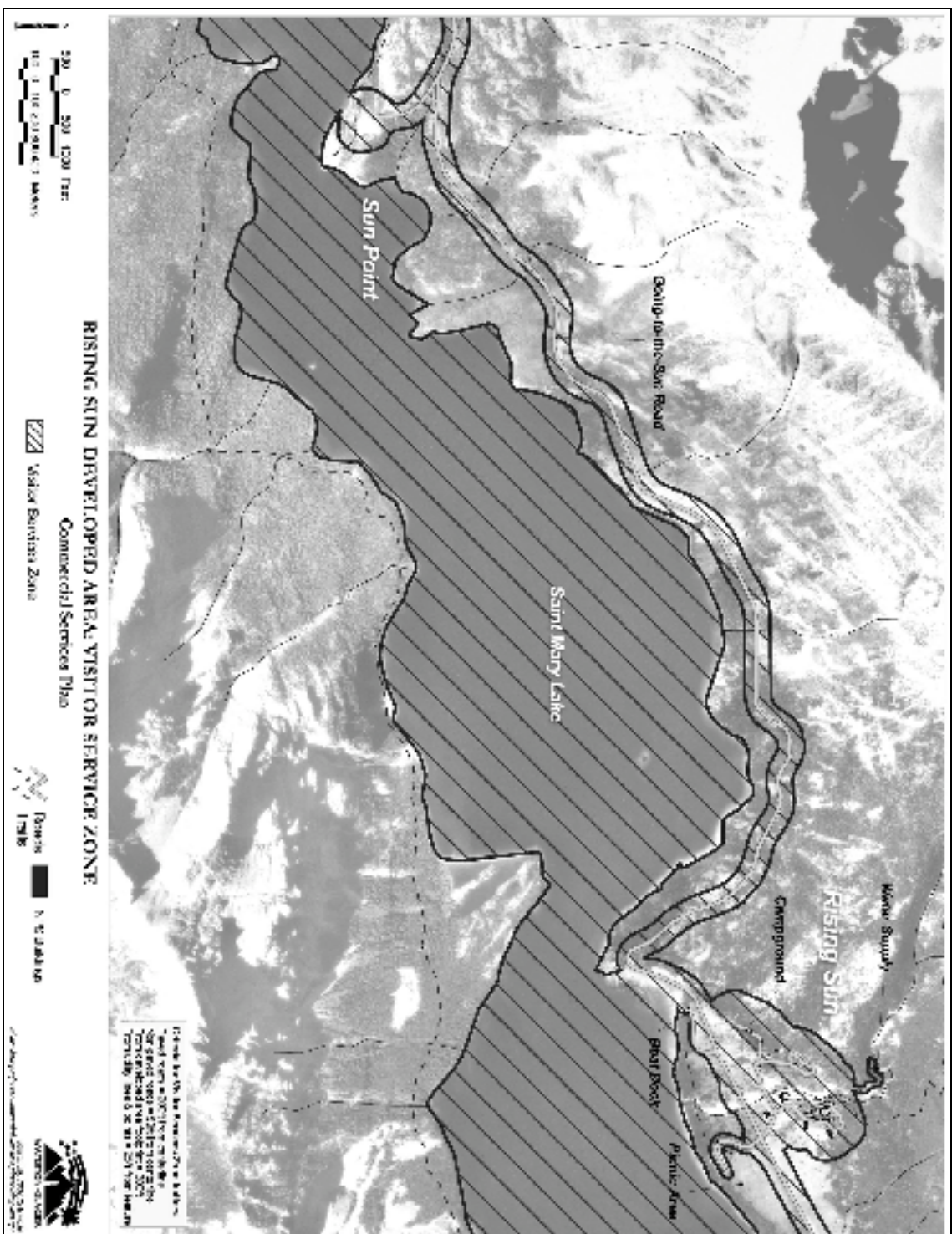
MANAGEMENT ZONES

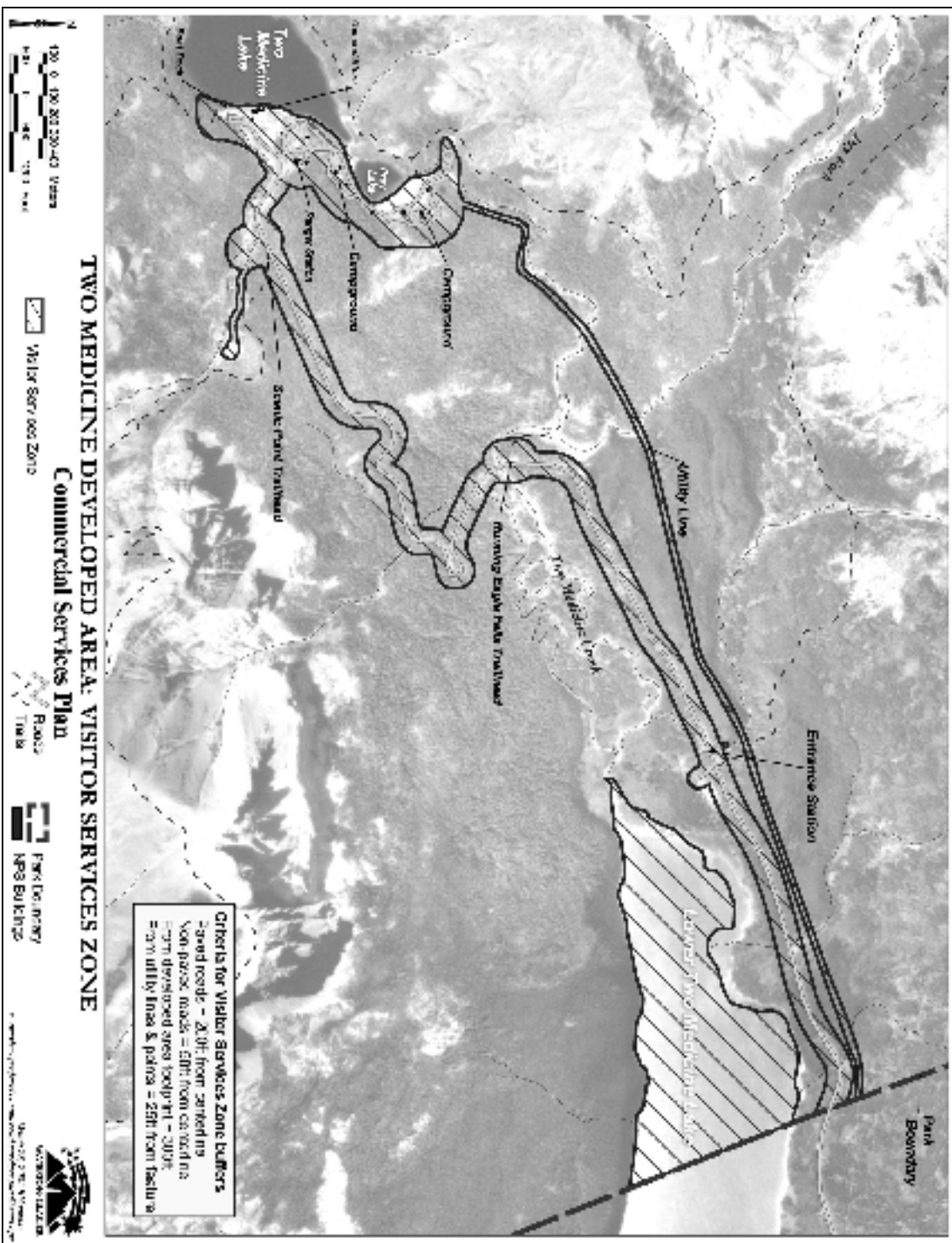
The following management zones were conceptually defined in the 1999 General Management Plan for each of the six geographic areas in the park. This plan more specifically defines two of these zones: the Visitor Use and, in some areas, the Rustic.



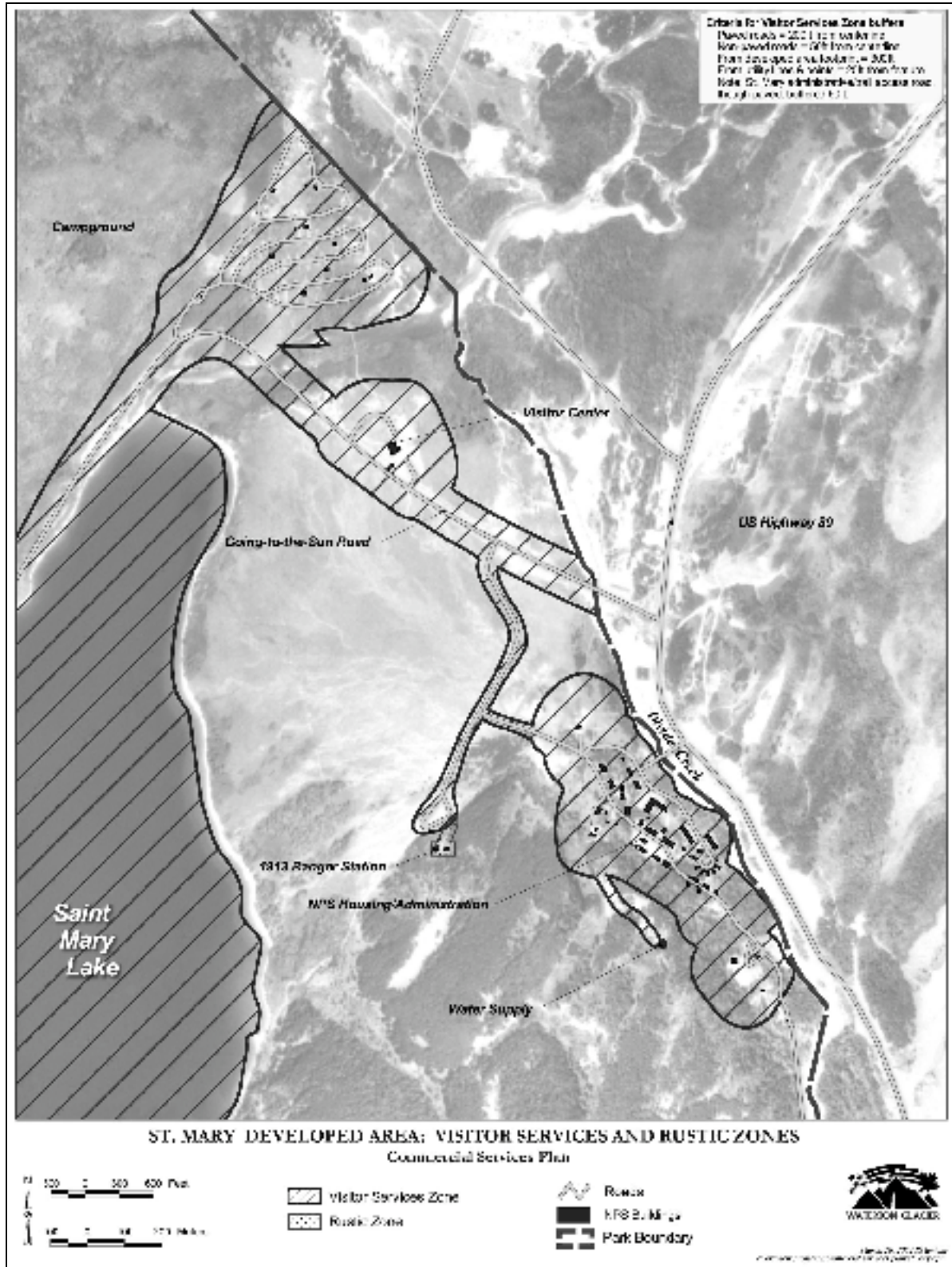


MAP A3-2 LAKE MCDONALD VISITOR SERVICES ZONE





MAP A3-4 TWO MEDICINE DEVELOPED AREA: VISITOR SERVICES ZONE



MAP A3-6 ST. MARY DEVELOPED AREA: VISITOR SERVICES AND RUSTIC ZONES

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Appendix 4

Comparative Site Alternative Analysis Supplemental Information

In keeping with the direction from the General Management Plan to retain the current level and types of services, a parkwide cap on the number of guest rooms has been set not to exceed 540 guest rooms (excluding the backcountry chalets and the businesses on private lands at Apgar). The estimated room counts listed below in alternatives B and C are subject to adjustment depending on the actual structural design for remodeling or construction. Actual room numbers would be adjusted during design to remain under the parkwide cap of 540.

For definitions of “budget,” “standard,” “high” and “deluxe” accommodations, see Appendix 2.

GRANITE PARK CHALET

Alternative A – Status Quo/No Action

Number of guest accommodations (rooms)	12
Number of guest accommodations (beds/pillows)*	37
Number of staff accommodations (beds)	2

Type/Range of Room Accommodations:
 Guest accommodations are backcountry chalet

Alternative B

Number of guest accommodations (rooms)	12
Number of guest accommodations (beds/pillows).....	37
Number of staff accommodations (beds)	2

Type/Range of Room Accommodations:
 Guest accommodations are backcountry chalet

Alternative C

Number of guest accommodations (rooms)	12
Number of guest accommodations (beds/pillows).....	35
Number of staff accommodations (beds)	8

Type/Range of Room Accommodations:
 Guest accommodations are backcountry chalet

SPERRY CHALET

Alternative A – Status Quo/No Action

Number of guest accommodations (rooms)	20
Number of guest accommodations (beds/pillows)*	42
Number of staff accommodations (beds)	8

Type/Range of Room Accommodations:
 Guest accommodations are backcountry chalet

APGAR

Alternative A – Status Quo/No Action

Number of guest accommodations (rooms)	36
Number of guest accommodations (beds/pillows)*	78/138
Number of staff accommodations (beds), Primary concessioner	Approximately 2
(Housing provided for manager only)	
Horse concessioner	Approximately 8

Number of parking spaces provided:
 Total number of spaces

	Approximately 137
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Type/Range of Room Accommodations:
 Guest accommodations include standard and high rooms, in lakeside motel units.

Alternative C

Number of guest accommodations (rooms) Approximately 110 - 120
 Number of guest accommodations (beds/pillows)..... N/A
 Number of staff accommodations (beds), Primary concessioner Approximately 170
 Horse concessioner Approximately 7
 Boat concessioner Approximately 4

Number of parking spaces provided:
 For guests..... Approximately 240 - 250
 For employees Approximately 40 - 45

Type/Range of Room Accommodations:

Guest accommodations include budget, standard, high and deluxe rooms, in hotel, motel, hostel and multi-unit cabins.

RISING SUN

Alternative A – Status Quo/No Action

Number of guest accommodations: (rooms) 72
 Number of guest accommodations: (beds/pillows)* 142/226
 Number of staff accommodations (beds), Primary concessioner Approximately 53
 Boat concessioner Approximately 8
 (2001 primary concessioner staffing count is 64)

Number of parking spaces provided:
 Total number of spaces Approximately 190
 (Count does not include parking at the boat launch area)

Type/Range of Room Accommodations:

Guest accommodations include standard rooms only, in both 2-unit cabins and motel units.

Alternative B

Number of guest accommodations (rooms) Approximately 75 - 80 rooms
 Number of guest accommodations (beds/pillows)..... N/A
 Number of staff accommodations (beds), Primary concessioner Approximately 64
 Boat concessioner Approximately 8

Number of parking spaces provided:
 For guests and employees..... Approximately 220
 (Count does not include parking at the boat launch area)

Type/Range of Room Accommodations:

Guest accommodations would include standard rooms only, in both 2-unit cabins and motel units. New guest accommodations would be in 2-unit cabins similar to the existing cabins, or in existing cabins reclaimed from employee housing use.

Alternative C

Number of guest accommodations (rooms) Approximately 75 - 80 rooms
 Number of guest accommodations (beds/pillows)..... N/A
 Number of staff accommodations (beds), Primary concessioner Approximately 77
 Boat concessioner Approximately 8

Number of parking spaces provided:
 For guests and employees..... Approximately 240
 (Count does not include parking at the boat launch area)

Type/Range of Room Accommodations:

Guest accommodations would include standard to high rooms, in both 2-unit cabins and motel units. New guest accommodations would be in 2-unit cabins (high quality accommodations) similar to the existing cabins, in existing cabins reclaimed from employee housing use, and at a renovated main dormitory building.

	Horse concessioner	Approximately 16
	Boat concessioner	Approximately 7
Number of parking spaces provided:		
	For guests	Approximately 123
	For employees	(Informal employee parking – count undetermined)

Type/Range of Room Accommodations:

Approximately 241 guest rooms - guest accommodations would include standard, high and deluxe rooms. There would be little change in accommodation room type at Many Glacier. However, approximately 7 rooms would become 2-room family suites, using space now used for employees. An additional 3 guest units would be developed at the Crow’s Nest level. There would be potential for additional standard, high and deluxe rooms, including suites with the conversion of the Lower Dormitory building for guest accommodations.

SWIFTCURRENT

Alternative A – Status Quo/No Action

Number of guest accommodations (rooms)	88
Number of guest accommodations (beds/pillows).....	158/271
(Bed/pillow count from primary concessioner update of 8/9/01)	
Number of staff accommodations (beds), Primary concessioner.....	55
Number of parking spaces provided:	
Total number of spaces	Approximately 193

Type/Range of Room Accommodations:

Guest rooms consist of 62 motel units with private baths, 24 individual guest cabins without private baths, and 2 individual guest cabins with private baths (shared toilet/shower facilities are provided nearby). Guest accommodations include budget and standard accommodations.

Alternative B

Number of guest accommodations (rooms)	Approximately 75 - 80
Number of guest accommodations (beds/pillows).....	N/A
Number of staff accommodations (beds), Primary concessioner.....	Up to 120
Number of parking spaces provided:	
For guests	Approximately 180 - 190
For employees	Approximately 40

Type/Range of Room Accommodations:

This alternative would provide between 75 and 80 rental units. All guest accommodations would be in individual cabins. Some existing cabins might be upgraded with private baths and all new cabins would have private baths. Guest accommodations would include budget and standard accommodations.

Alternative C

Number of guest accommodations (rooms)	Approximately 85 - 95
Number of guest accommodations (beds/pillows).....	N/A
Number of staff accommodations (beds), Primary concessioner.....	Up to 118
Number of parking spaces provided:	
For guests	Approximately 200 - 210
For employees	Approximately 55 - 65

Type/Range of Room Accommodations:

This alternative would provide between 90 and 100 rental units. Guest accommodations would be in both individual cabins and motel units. Some existing cabins might be upgraded with private baths. All new cabins would have private baths. Guest accommodations would include budget and standard accommodations.

*Bed/pillow count from primary concessioner update of 8/9/01

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Appendix 5 Park Visitation

PARK VISITATION, JANUARY 1979-DECEMBER 2002

The following table shows monthly records of Glacier National Park visitation uses for the past 22 years. The table allows cross-comparison of numerous activities by monthly time periods or cumulative periods of time. The table shows in particular a consistent set of the peak, shoulder and off-season months for each year in the category of concessioner lodging, while varying significantly from year-to-year. It also shows a modest upward trend in lodge usage over the 22-year period.

Month	Year	Recreation Visits	Non-Recreation Visits	Total Visits	Lodging	Tent Campers	RV Campers	Total RV/Tent Campers	Backcountry Campers	Total Overnight Stays
January	1979	6357	10	6367	0	2	2	4	19	23
February	1979	3480	11	3491	0	0	7	7	18	25
March	1979	11790	4	11794	0	1	15	16	197	213
April	1979	15000	23	15023	0	37	81	118	95	213
May	1979	65923	10	65933	215	1030	1699	2729	329	3273
June	1979	235210	8	235218	12949	10022	18271	28293	2761	44003
July	1979	414460	15	414475	36218	35656	52488	88144	7515	131877
August	1979	404303	40	404343	34781	37676	46965	79641	10631	125053
September	1979	176600	19	176619	9223	9477	12195	21672	3311	34206
October	1979	75265	10	75275	0	2169	2450	4619	421	5040
November	1979	32616	0	32616	0	905	465	1370	116	1486
December	1979	5082	0	5082	0	25	9	34	26	60
January	1980	6156	10	6166	0	16	3	19	52	71
February	1980	6156	50	6206	0	59	40	99	101	200
March	1980	8900	95	8995	0	136	91	227	186	413
April	1980	21109	95	21204	0	105	98	203	76	279
May	1980	67903	50	67953	87	1687	2495	4182	279	4548
June	1980	237851	40	237891	15872	12741	17777	30518	2427	48817
July	1980	446853	40	446893	37187	33646	42600	75246	7822	120255
August	1980	423107	50	423157	36948	25962	37434	67396	9265	113609
September	1980	151586	200	151786	9013	9509	9253	18762	1959	29734
October	1980	78063	300	78363	0	1451	2160	3611	327	3938
November	1980	22503	30	22533	0	386	309	695	87	782
December	1980	4391	0	4391	0	20	54	74	59	133
January	1981	8964	10	8974	0	30	47	77	56	133
February	1981	8278	10	8288	0	7	68	75	51	126
March	1981	15483	10	15493	0	96	102	198	125	323
April	1981	26804	10	26814	0	151	190	341	56	397
May	1981	75907	20	75927	87	2430	2699	5129	175	5391
June	1981	260397	40	260437	17564	12044	16091	28135	1585	47284
July	1981	571302	48	571350	38377	37121	64151	101272	87805	144818
August	1981	510227	48	510275	37731	37820	49985	87805	7753	133289
September	1981	201982	54	202036	8482	14363	16489	30852	2452	41786
October	1981	61304	48	61352	0	1644	1953	3597	208	3805
November	1981	37964	20	37984	0	901	429	1330	48	1378
December	1981	7911	10	7921	0	8	3	11	66	77
January	1982	5368	10	5378	0	55	7	62	11	73
February	1982	5463	5	5468	0	26	0	26	114	140
March	1982	9761	20	9781	0	89	0	89	120	209
April	1982	20038	7	20045	0	129	61	190	77	267
May	1982	57529	32	57561	31	1336	1822	3158	53	3242
June	1982	237560	45	237605	14771	12048	16318	28366	1274	44411
July	1982	529862	40	529902	36512	35118	54675	89793	5316	131621
August	1982	513554	37	513591	35461	35590	48743	84333	7057	126851
September	1982	196896	40	196936	9423	9250	11558	20808	1927	32158
October	1982	65203	40	65243	0	1173	1183	2356	201	2557
November	1982	18752	20	18772	0	374	204	578	23	601
December	1982	6128	20	6148	0	24	3	27	25	52
January	1983	7183	0	7183	0	0	17	17	31	48
February	1983	7178	0	7178	0	7	57	64	105	169
March	1983	12116	0	12116	0	4	85	89	86	175
April	1983	26414	423	26837	0	173	313	486	24	510
May	1983	87249	189	87438	0	1529	2123	3652	146	3798
June	1983	310923	346	311269	13878	10488	17490	27978	1323	43179

Month	Year	Recreation Visits	Non-Recreation Visits	Total Visits	Lodging	Tent Campers	RV Campers	Total RV/Tent Campers	Backcountry Campers	Total Overnight Stays
July	1983	689489	596	690085	36929	33969	55655	89624	4724	131277
August	1983	673399	497	673896	36626	37120	57627	94747	7012	138385
September	1983	280628	895	281523	12342	5667	8582	14249	1806	28397
October	1983	63185	40	63225	0	1454	1463	2917	170	3087
November	1983	39810	40	39850	0	476	399	875	36	911
December	1983	6273	20	6293	0	11	0	11	44	55
January	1984	6468	20	6488	0	7	0	7	22	29
February	1984	9255	20	9275	0	7	0	7	44	51
March	1984	12067	20	12087	0	3	0	3	129	132
April	1984	31817	20	31837	0	143	167	310	18	328
May	1984	62456	20	62476	235	911	1642	2553	218	3006
June	1984	321531	1203	322734	12879	9257	16443	25700	1501	40080
July	1984	628414	2668	631082	34501	35032	56603	91635	5099	131235
August	1984	545651	2913	548564	46346	32322	43822	76144	6605	129095
September	1984	221746	981	222727	5230	4518	8407	12925	1157	19312
October	1984	70526	40	70566	0	951	1156	2107	175	2282
November	1984	29100	20	29120	0	212	248	460	4	464
December	1984	7672	20	7692	0	10	0	10	60	70
January	1985	4720	20	4740	0	0	22	22	48	70
February	1985	5587	20	5607	0	3	6	9	20	29
March	1985	12084	20	12104	0	27	24	51	102	153
April	1985	36976	20	36996	0	57	73	130	37	167
May	1985	91914	20	91934	568	1121	1731	2852	398	3818
June	1985	296523	1440	297963	14808	9742	13715	23457	1969	40234
July	1985	487859	2339	490198	38096	26698	61324	68022	4443	110561
August	1985	423209	2086	425295	36898	21745	31744	53489	5828	96215
September	1985	142337	2399	144736	2969	2779	6145	8924	1114	13007
October	1985	61381	80	61461	0	530	661	1191	50	1241
November	1985	36941	20	36961	0	81	205	286	0	286
December	1985	3480	20	3500	0	3	19	22	10	32
January	1986	5442	20	5462	0	0	22	22	111	133
February	1986	3725	20	3745	0	5	10	15	45	60
March	1986	10192	20	10212	0	3	30	33	229	262
April	1986	26049	20	26069	0	155	139	294	40	334
May	1986	90992	40	91032	775	1359	2083	3442	200	4417
June	1986	270600	1089	271689	17705	9643	17581	27224	1333	46262
July	1986	465816	2064	467880	38040	23305	43577	66882	4524	109446
August	1986	459919	2175	462094	32948	26160	40210	66370	6522	105840
September	1986	148825	1110	149935	5720	3534	6265	9799	1441	16960
October	1986	71771	80	71851	0	962	1460	2422	244	2666
November	1986	18347	20	18367	0	122	119	241	27	268
December	1986	7473	20	7493	0	3	10	13	53	68
January	1987	6541	20	6561	0	0	0	0	63	63
February	1987	7118	20	7138	0	11	0	11	124	135
March	1987	8354	20	8374	0	13	3	16	51	67
April	1987	29332	20	29352	0	216	103	216	73	289
May	1987	88708	80	88788	288	1994	3318	5312	200	5800
June	1987	282364	1247	283611	10104	11000	17546	28546	2088	40738
July	1987	501229	2481	503710	39215	26260	44014	70274	5375	114864
August	1987	436418	2512	438630	39219	26983	37814	64797	7087	111103
September	1987	200384	1153	201537	9806	7596	11096	18692	1777	30275
October	1987	67647	20	67667	0	1165	1934	3099	409	3508
November	1987	25070	20	25090	0	84	119	203	38	241
December	1987	7872	20	7892	0	6	20	26	29	55

Month	Year	Recreation Visits	Non-Recreation Visits	Total Visits	Lodging	Tent Campers	RV Campers	Total RV/Tent Campers	Backcountry Campers	Total Overnight Stays
January	1988	6306	20	6326	0	3	21	24	43	67
February	1988	8433	20	8453	0	21	16	37	86	123
March	1988	10256	20	10276	0	22	25	47	49	96
April	1988	25452	20	25472	0	202	267	469	13	482
May	1988	79954	183	80137	722	1851	3904	5755	225	6702
June	1988	2920208	1861	292069	11456	11801	19226	31027	1841	44324
July	1988	583916	2156	586072	35555	32727	46670	79397	5826	120778
August	1988	508564	2098	510662	37695	31095	45174	76269	6814	120778
September	1988	204186	1114	205300	10415	6298	11184	17482	1579	29476
October	1988	75624	119	75743	0	1118	1809	2927	384	3311
November	1988	18150	20	18170	0	78	105	183	24	207
December	1988	6684	20	6704	0	32	0	32	25	57
January	1989	7524	20	7544	0	0	13	13	53	66
February	1989	7237	20	7257	0	3	0	3	120	123
March	1989	12111	20	12131	0	0	54	54	69	123
April	1989	25457	20	25477	0	82	89	171	11	182
May	1989	71760	249	72009	822	965	2003	2968	219	4009
June	1989	300384	1562	301946	17545	10040	19973	30013	1492	49050
July	1989	586500	2435	588935	35238	33208	48214	81422	5995	122655
August	1989	499464	2261	501725	40894	29468	34862	64330	6572	111796
September	1989	236284	832	237116	12299	6929	11225	18154	2030	32483
October	1989	54142	145	54287	0	591	1361	1952	243	2195
November	1989	13320	20	13340	0	38	33	71	103	174
December	1989	7340	20	7360	0	19	8	27	62	89
January	1990	7286	20	7306	0	14	73	87	24	111
February	1990	7738	20	7758	0	14	14	14	51	65
March	1990	14021	20	14041	0	13	19	32	46	78
April	1990	24443	20	24463	0	92	184	276	51	327
May	1990	81628	58	81686	595	1034	1914	2948	146	3689
June	1990	288607	1651	290258	13743	10264	17412	27676	1566	42985
July	1990	627322	1840	629162	33551	32412	51516	84928	6517	124996
August	1990	593055	1638	594693	40633	31037	35359	66396	7976	115005
September	1990	280411	633	281044	16326	9124	12803	21927	2867	41120
October	1990	42362	20	42382	0	659	783	1442	166	1608
November	1990	16718	20	16738	0	70	45	115	32	147
December	1990	3146	20	3166	0	3	0	3	14	17
January	1991	4936	20	4956	0	5	8	13	66	79
February	1991	8447	20	8467	0	22	11	33	77	110
March	1991	10704	20	10724	0	30	8	38	108	146
April	1991	24405	20	24425	0	41	30	71	31	102
May	1991	82333	490	82823	758	859	1277	2136	221	3115
June	1991	300610	1744	302354	14521	10940	15112	26052	1759	42332
July	1991	646943	2132	649075	39456	41824	43838	85662	6906	132024
August	1991	643324	2119	645443	34198	44994	46275	91269	10096	135563
September	1991	286582	894	287476	16890	10987	13169	24156	3268	44314
October	1991	71872	20	71892	0	1618	2160	3778	344	4122
November	1991	9971	20	9991	0	16	54	70	8	78
December	1991	6839	20	6859	0	44	25	69	25	94
January	1992	7177	20	7197	0	16	11	27	48	75
February	1992	8995	20	9015	0	13	6	19	71	90
March	1992	20027	20	20047	0	54	33	87	130	217
April	1992	34501	20	34521	0	191	286	477	104	581
May	1992	133553	379	133932	628	2681	3097	5778	567	6973
June	1992	366534	1914	368448	14543	17039	20558	37597	2743	54883

Month	Year	Recreation Visits	Non-Recreation Visits	Total Visits	Lodging	Tent Campers	RV Campers	Total RV/Tent Campers	Backcountry Campers	Total Overnight Stays
July	1992	647193	1816	649009	39255	38094	41658	79752	9307	128314
August	1992	609629	1578	611207	34111	36903	32164	69067	10497	113675
September	1992	285958	637	286595	22650	8692	9545	18237	3508	44395
October	1992	68290	20	68310	142	1325	1272	2597	359	3098
November	1992	12410	20	12430	0	38	44	82	14	96
December	1992	5500	20	5520	0	5	41	46	5	51
January	1993	7080	20	7100	0	14	10	24	71	95
February	1993	9402	20	9422	0	3	17	20	108	128
March	1993	14808	20	14828	0	24	22	46	143	189
April	1993	26675	20	26695	0	194	78	272	39	311
May	1993	113148	36	113184	946	1549	1462	3011	413	4370
June	1993	340288	1290	341578	21980	12207	14720	26927	2517	51424
July	1993	626668	1271	627939	21742	28951	34349	63300	5931	90973
August	1993	624559	1209	625768	34394	36408	31458	67866	10574	112834
September	1993	288356	656	289012	17097	9986	10715	20701	3748	41546
October	1993	71304	20	71324	0	1163	833	1996	371	2367
November	1993	11216	20	11236	0	130	90	220	48	268
December	1993	8200	20	8220	0	19	16	35	89	124
January	1994	8625	20	8645	0	3	30	33	71	104
February	1994	6922	20	6942	0	0	3	3	90	93
March	1994	17926	20	17946	0	22	49	71	113	184
April	1994	26334	20	26354	0	116	73	189	90	279
May	1994	114236	111	114347	951	2188	2446	4634	599	6184
June	1994	327882	1130	329012	22054	14734	16445	31179	2811	56044
July	1994	666871	1375	668246	37838	41172	37545	78717	9465	126022
August	1994	595936	1230	597166	42487	40826	31099	71925	12511	126923
September	1994	309585	675	310260	17880	10613	13884	24497	4359	46736
October	1994	62171	20	62191	0	902	840	1742	413	2155
November	1994	8434	20	8454	0	38	46	84	60	144
December	1994	8087	20	8107	0	57	16	73	76	149
January	1995	8441	20	8461	0	30	27	57	92	149
February	1995	10573	20	10593	0	3	3	30	90	120
March	1995	16013	20	16033	0	71	33	104	128	232
April	1995	25869	20	25889	0	222	170	392	72	464
May	1995	110206	151	110357	768	1983	2287	4270	674	5712
June	1995	249808	1869	251677	20169	14455	14232	28687	2218	51074
July	1995	552643	2989	555632	37783	40473	35963	76436	8873	123092
August	1995	515842	3601	519443	41052	41014	27505	68519	11918	121489
September	1995	289248	1447	290695	16768	12613	11373	23986	4529	45283
October	1995	51025	20	51045	0	478	562	1040	300	1340
November	1995	7395	20	7415	0	14	13	27	25	52
December	1995	2455	20	2475	0	5	3	8	4	12
January	1996	5227	20	5247	0	3	24	27	17	44
February	1996	11058	20	11078	0	16	24	40	106	146
March	1996	12934	20	12954	0	11	24	35	96	131
April	1996	25388	80	25468	0	159	97	256	67	323
May	1996	100027	333	100608	333	941	1577	2518	84	2935
June	1996	251397	2780	254177	21215	13304	13598	26902	2452	50569
July	1996	515064	3964	519028	38020	40228	32222	72450	8807	119277
August	1996	477618	3908	481526	37066	39239	29160	68399	12004	117469
September	1996	254310	2409	256719	16348	6621	7460	14081	3800	34229
October	1996	60231	812	61043	0	865	706	1571	327	1898
November	1996	2589	80	2669	0	35	11	46	25	71
December	1996	4962	80	5042	0	5	14	19	21	40

Month	Year	Recreation Visits	Non-Recreation Visits	Total Visits	Lodging	Tent Campers	RV Campers	Total RV/Tent Campers	Backcountry Campers	Total Overnight Stays
January	1997	6591	20	6611	0	5	0	5	66	71
February	1997	8618	20	8638	0	54	0	54	104	158
March	1997	11710	20	11730	0	22	19	41	170	211
April	1997	16116	20	16136	0	19	38	57	261	318
May	1997	64446	323	64769	504	1304	1328	2632	295	3431
June	1997	209675	5734	215409	18836	12117	11756	23873	2035	44744
July	1997	517078	3169	520197	38895	37053	29806	66859	8045	113713
August	1997	517010	2852	519862	38945	41431	27495	68926	12156	120027
September	1997	281018	1622	282640	15706	10558	9560	20118	4198	40022
October	1997	53262	591	53853	0	664	769	1433	405	1838
November	1997	15168	20	15188	0	62	60	122	98	220
December	1997	8214	20	8234	0	5	5	10	79	89
January	1998	7481	20	7501	0	3	0	3	26	29
February	1998	9686	20	9706	0	24	14	38	126	164
March	1998	13316	20	13336	0	41	30	71	71	142
April	1998	24166	20	24186	0	95	68	163	79	242
May	1998	89146	328	89474	750	1383	1575	2958	567	4275
June	1998	255237	2558	257795	23212	10805	11337	22142	2920	48274
July	1998	540488	3004	543492	38729	37047	32278	69325	8678	116732
August	1998	528716	2773	531489	38478	41337	26244	67581	12374	118433
September	1998	286602	1308	287910	18041	14443	12081	26524	4487	49052
October	1998	57164	416	57580	0	481	497	978	423	1401
November	1998	12029	20	12049	0	32	27	59	68	127
December	1998	6913	20	6933	0	8	8	16	17	33
January	1999	7050	20	7070	0	22	5	27	73	100
February	1999	8371	20	8391	0	27	5	32	37	69
March	1999	13788	20	13808	0	27	14	41	111	152
April	1999	20112	20	20132	0	103	49	152	108	260
May	1999	81002	118	81120	442	1555	2116	3671	414	4527
June	1999	232339	1775	234114	23394	11569	10629	22198	2170	47762
July	1999	526595	3123	529718	39888	37144	29764	66908	7326	114122
August	1999	491717	2455	494172	45303	36374	25225	61599	11425	118327
September	1999	232246	1624	233870	20686	12125	10447	21215	4199	46100
October	1999	50378	20	50398	1375	481	489	970	239	2584
November	1999	13484	80	13564	0	19	27	46	34	80
December	1999	7522	20	7542	0	5	8	13	73	86
January	2000	8118	80	8198	0	51	14	65	93	158
February	2000	8656	80	8736	0	11	11	22	186	208
March	2000	12112	80	12192	0	24	11	35	175	210
April	2000	20796	20	20816	0	68	59	127	45	172
May	2000	86594	20	86614	963	1858	1904	3762	461	5186
June	2000	243723	2500	246223	20870	13058	11762	24820	2415	48105
July	2000	514937	2587	517524	40028	37430	29219	66649	7802	114479
August	2000	522578	2536	525114	37915	34877	23681	58558	10913	107386
September	2000	231886	1463	233349	15698	6258	7244	13502	2618	31818
October	2000	59849	20	59869	0	340	534	874	213	1087
November	2000	11922	20	11942	0	27	14	41	30	71
December	2000	7522	20	7542	0	5	8	13	59	72
January	2001	8380	20	8400	0	19	5	24	68	92
February	2001	8451	20	8471	0	3	3	6	72	78
March	2001	13677	20	13697	0	16	19	35	100	135
April	2001	18388	20	18408	0	57	51	108	8	116
May	2001	90692	20	90712	1319	2035	2373	4408	554	6281
June	2001	230625	1321	231946	21913	11909	13356	25265	2542	49720

Month	Year	Recreation Visits	Non-Recreation Visits	Total Visits	Lodging	Tent Campers	RV Campers	Total RV/Tent Campers	Backcountry Campers	Total Overnight Stays
July	2001	490693	1494	492187	38355	34815	28543	63358	9349	111062
August	2001	485240	2560	487800	35072	38330	25516	63846	12016	110934
September	2001	261525	1980	263505	13380	7666	6760	14426	3761	31567
October	2001	53852	25	53877	0	167	206	373	365	738
November	2001	15704	20	15724	0	13	7	20	48	68
December	2001	3387	20	3407	0	4	7	11	32	43
January	2002	6171	20	6191	0	20	9	29	82	111
February	2002	9065	20	9085	0	8	21	29	26	55
March	2002	9097	20	9117	0	43	9	52	64	116
April	2002	18887	20	18907	0	73	69	142	73	215
May	2002	82027	356	82383	488	1228	1626	2854	215	3557
June	2002	225695	1347	227042	19950	10223	11772	21995	1699	43644
July	2002	585823	1632	587455	41146	35460	34743	70203	7986	119335
August	2002	549161	1382	550543	40816	32365	30123	62488	12213	115517
September	2002	305959	611	306570	10977	10123	11811	21934	4328	37239
October	2002	87651	182	87833	172	640	852	1492	339	2003
November	2002	17819	53	17872	0	30	60	90	29	119
December	2002	8334	2	8336	0	33	42	75	22	97

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Glossary

Adfluvial

Of, relating to, or living in a lake; produced by the action of a stream

Alluvial

Composed of clay, silt, sand, gravel, or similar detrital material deposited by running water

Berm

A mound or wall of earth

Biota

The flora and fauna of a region

Extirpation

To destroy completely; to wipe out; to pull up by the root

Fen

Lowland covered wholly or partly with water unless artificially drained

Forbs

An herb other than grass

Fluvial

Of, relating to, or living in a stream or river; produced by the action of a stream

Hibernacula

A shelter occupied during the winter by a dormant animal (such as an insect or reptile)

Ichthyofauna

The fish life of a region

Krummholz

Stunted forest characteristic of the timberline

Lacustrine

Of, relating to, formed in, living in, or growing in lakes

Lithic

Stony; of, relating to, or being a stone tool

Nonpoint Source Pollution

Pollution that occurs when rainfall, snowmelt, or irrigation runs over land or through the ground, picking up pollutants and depositing them into rivers, lakes and coastal waters, or introducing them into the groundwater

Phosphorus

An element occurring in manure and chemical fertilizer that is essential to the growth and development of plants, but which, in excess, can cause water to become polluted and threaten aquatic animals

Phosphorus Loading

The quantities of phosphorus in water

Point Source

The origin of a pollutant discharge from a discrete source, such as effluent from the end of a pipe

Riverine

Relating to, formed by, or resembling a river; living or situated on the banks of a river

Sedimentation

The action or process of forming or depositing sediment

Ungulate

A hooved animal

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Abbreviations and Acronyms

ADA	Americans With Disabilities Act
ARC	Architectural Research Consultants, Incorporated
BLM	Bureau of Land Management
CCE	Crown of the Continent Ecosystem
CEQ	Council on Environmental Quality
CPR	Cardiopulmonary Resuscitation
CSP	Commercial Services Plan
DCP	Development Concept Plan
DEIS	Draft Environmental Impact Statement
DOI	Department of the Interior
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
GIS	Geographic Information Systems
GMP	General Management Plan
GNP	Glacier National Park
GPI	Glacier Park, Inc.
GTSR	Going-to-the-Sun-Road
IMPROVE	Interagency Monitoring of Protected Visual Environments
LNT	Leave No Trace
MDFWP	Montana Department of Fish, Wildlife and Parks
MNHP	Montana Natural Heritage Program
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
pers. comm.	Personal Communication
PM10	Particulate Matter
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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