

Protecting the Crown

A Century of Resource Management in Glacier National Park

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Theodore Catton, Principal Investigator
University of Montana
Department of History
Missoula, Montana 59812

Diane Krahe, Researcher
University of Montana
Department of History
Missoula, Montana 59812

Deirdre K. Shaw
NPS Key Official and Curator
Glacier National Park
West Glacier, Montana 59936

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Introduction

Protecting the Crown



One hundred years ago, Glacier

National Park's first operations manual featured a set of rules and regulations that came to just 13 paragraphs. The miniscule park staff at the end of the park's first year consisted of a superintendent and a handful of rangers. In contrast, at the present time (2010), Glacier has no fewer than 14 separate management plans pertaining to various park resources from bears and wolves to exotic plants and hazard trees. Its staff has grown to around 160 permanent employees in six divisions. The Division of Science and Resources Management includes specialists in the disciplines of terrestrial and fisheries biology, ecology, horticulture, geography, history, and historic architecture, among others, while the Division of Visitor and Resource Protection includes specialists in fire management and wilderness management. In addition, the park's resource management efforts are directly supported by scientists employed by the U.S. Geological Survey who are assigned virtually fulltime to the park as well as numerous academic researchers and additional Park Service personnel located in other offices. Today, resource management in Glacier is the result of all these people's combined efforts. At base, this report draws a timeline from 1910 to 2010 and describes the process of evolution of resource management over the park's first century. It examines continuity and change within an organization whose trajectory, like that of most organizations, has been toward greater and greater specialization and complexity. This resource management history forms a part of the park's administrative history.

This report also aims to be an environmental history of Glacier. It aims to identify and analyze significant connections between environmental change and social change. In the Glacier context, social change encompasses everything from the growth of human population, agriculture, and industry in the surrounding region, to the evolution of the park visitor experience, the development of new environmental laws, and our changing conceptions of nature.

One hundred years after Congress set aside Glacier as a public park and directed the Secretary of the Interior to preserve it in “a state of nature,” resource managers are probably more skeptical about their ability to fulfill that mandate than ever before. If we have learned one thing about the natural world over the past century, it is the fact that nature is dynamic and deeply intertwined with human civilization. If a state of nature once implied qualities of separateness and permanence, Glacier’s managers now emphasize that the park is inextricably tied to the surrounding region and that the only constant in nature is change. In the early days, park managers conceived of their task as principally one of resource *protection* – protecting park resources from various types of exploitation prohibited by law or regulations. Now they engage in a more active, science-based form of resource *management*. They aim to maintain natural processes, to preserve ecosystem resilience, to conserve biodiversity, and to protect and manage cultural resources. Acknowledging that human influences in nature are ubiquitous, they strive to temper those influences so that Glacier may exist in a relatively pristine, albeit humanly altered, condition.

This report is in five chronological chapters. The first chapter describes Glacier’s natural and cultural setting prior to establishment. The subsequent four chapters cover the century-long history of the park in roughly 25-year increments. These four chapters each center on a dominant metaphor of how park managers conceived of nature and resource management in Glacier. Each metaphor or conceptualization may be viewed as the next in a sequence. But in each case the older thinking was not discarded; it was simply pushed into the background. Thus, earlier metaphors of nature may be more properly viewed as layers, one layered on top of another, each giving rise to a more complex and textured understanding of what was involved in preserving the park in a state of nature. The four metaphors might be given the shorthand labels of reservoir, sanctuary, relic, and ecosystem.

- *Reservoir*. From 1910 to about 1931, the dominant metaphor for Glacier National Park came from the wildlife conservation movement and described the area as a big game refuge or “reservoir of nature” for the replenishment of depleted wildlife populations – especially such valued game species as deer and elk. Notable

features of this era included a strong emphasis on prevention of poaching and destruction of predators and efforts to “stock” wildlife range with game and to “stock” park waters with trout.

- *Sanctuary*. From about 1931 to about 1963, the notion of the park as big game refuge was enlarged into “complete sanctuary.” Influenced by the rise of ecological perspectives, park managers sought to erase old distinctions between “good” and “bad” animals and to treat all native species as equal members in a total community of life. The era saw the beginnings of field research oriented to understanding species in relation to their habitat.
- *Relic*. From 1963 to about 1992, the Leopold Report supplied the dominant metaphor for nature in Glacier with its famous proposition that “a national park should represent a vignette of primitive America.” Ecological restoration, research-based management, preservation of wilderness values, and recognition of historic resources were the hallmarks of this new outlook. The aim of resource management was to preserve or re-establish conditions reflective of a time in the past. As a historical vignette, the park was an island – consciously juxtaposed with landscape transformations occurring all around it.
- *Ecosystem*. When external threats to the park mounted, Glacier began to appear less like an island stronghold and more like an island under siege – vulnerable in its isolation. Finally, around 1992, the ecosystem concept and the elusive goal of ecosystem management came to the fore. The relic or island imagery that had remained popular into the early 1980s gradually yielded to a satellite view of Glacier ensconced within a larger bioregion called the Crown of the Continent Ecosystem. In this newest conception, the relationship between the natural environment and the human environment of nearby towns and industries became one of interdependence. Furthermore, the aim of managing natural conditions to resemble a historical time period yielded to a new emphasis on allowing natural ecosystem processes such as fire, floods, avalanches, forest succession and native insects and disease pathogens to play their role in altering local ecosystem conditions. The park was no longer preserving the landscape in a particular state, but preserving processes that naturally shape the landscape over time. The sustainable ecosystem currently reigns as the dominant metaphor for understanding what it means to preserve Glacier in a state of nature.

Metaphors are necessary for making complex things comprehensible. They are, in turn, influential, for they shape our perceptions of reality. Two other well-known metaphors for Glacier essentially predate resource management of the park and illustrate

the power of metaphor to forge as well as reflect reality. The Blackfeet called the mountains of Glacier “the Backbone of the World.” Their view of the mountains was reverential, in keeping with their mythology, which held that the mountains were the dwelling place of great spirits like Wind Maker, Cold Maker, and Thunder. The metaphor, Backbone of the World, proclaimed the mountains as part of the Blackfeet homeland and in its organic imagery it situated the Blackfeet within the ecological community. Meanwhile, the Great Northern Railroad made the most of early Euro-American descriptions that compared these same mountains to the Swiss Alps. In its early-twentieth-century advertising campaign, Glacier became “the Switzerland of America.” The advertising slogan not only drew tourists from the East but left a lasting imprint on Glacier’s built environment in the Swiss-style architecture of the hotels and chalets.

Today, the dominant metaphor for Glacier is “the Crown of the Continent Ecosystem.” While the emphasis is on the ecosystem concept, it revives the Crown of the Continent name first given to the area by George Bird Grinnell. The metaphor has a literal basis in the fact that three major river basins, the Columbia, the Missouri-Mississippi, and the Saskatchewan, meet on Triple Divide Peak and descend from there to the Pacific Ocean, the Gulf of Mexico, and Hudson Bay respectively. But the real power of the Crown of the Continent metaphor is found in its imagery of a majestic and relatively pristine mountain mass sitting enthroned at the heart of the continent. The metaphor elicits awe and respect in keeping with its overtones of monarchy and pageantry.

Chapter 1

A Homeland and a Frontier

Glacier before 1910



1.1 Two Cultural Legacies

People have been interacting with nature in Glacier National Park for a very long time. Millennia before the area became a national park, native peoples moved in and out of the area on seasonal rounds, hunting and gathering for their subsistence. Regarding the earth as their mother and all its creatures as their relations, they perceived themselves as guardians of a living community. For them, Glacier's shining mountains formed a part of their homeland and "the Backbone of the World." In the nineteenth century, Euro-Americans, possessing a different worldview, entered the area in search of valuable furs, minerals, transportation routes, and places to homestead. Mostly coming from the settled parts of the United States, these pioneers looked on Glacier as a part of the western frontier, an unredeemed wilderness. It was a place as forbidding as it was beautiful. The two cultures brought vastly different forms of resource use to bear on the area, but both left an imprint that would have lasting implications for the national park.¹

The late eminent conservation biologist Raymond F. Dasmann offers us a useful perspective with which to compare these two cultural legacies. Dasmann suggested that all of humanity could be divided into two categories, or what he called "ecosystem people" and "biosphere people." The former included all traditional or primitive cultures; the latter included everyone who was tied to the global technological

¹ Mark David Spence, "Crown of the Continent, Backbone of the World: The American Wilderness Ideal and Blackfeet Exclusion from Glacier National Park," *Environmental History* 1, no. 3 (July 1996): 29-49.

civilization. Ecosystem people lived within one or perhaps two or three closely related ecosystems. They had to live simply within the carrying capacity of their own ecosystems or face the consequences of overshooting their own limited resource base. In contrast, biosphere people could exploit the resources of one ecosystem to the point of causing great devastation – something that would be impossible or unthinkable for people who were dependent upon the particular ecosystem. Conversely, biosphere people could afford to create national parks or public places where nature would be entirely preserved from human consumptive uses. Writing in the mid 1970s while on the faculty of the International Union for Conservation of Nature and Natural Resources in Gland, Switzerland, Dasmann observed that most of the potential national parklands remaining in the world were inhabited by ecosystem people. If governments were to establish nature preserves in these areas, Dasmann urged, they must be established in such a way as not to dispossess the ecosystem people, a land-use scheme he described as “future primitive.”²

According to Dasmann’s framework, Glacier’s “ecosystem people” were already in transition to becoming “biosphere people” when Glacier National Park was created in 1910. Both the Blackfoot Nation on the east and the Confederated Salish and Kootenai Tribes on the west had ceded aboriginal title to those lands many years prior to the park’s establishment. By 1910, all of these tribes were in transition to reservation economies based on farming and stock raising. Like most other Indian peoples whose aboriginal homelands overlapped with national parklands, Glacier’s ecosystem people were a generation removed from their traditional hunting and gathering economy when the park came into being. As a result of those severed ties, Americans tended to overlook historical Indian use and occupancy of national parks. Glacier’s resource managers often made that same oversight.

More recently, resource managers and the general public have come to recognize that Indians not only inhabited these areas, they also helped shape the environment. While the resource demands of these cultures were extremely light compared to those of the modern era, their effects on the ecosystem were present over vast stretches of time. As prehistoric examples of Dasmann’s ecosystem people, Indians lived within the ecosystem and were part of the ecosystem but they also shaped the ecosystem – as predators, cultivators, and makers of fire. When the Blackfoot, Salish and Kootenai tribes faced the westward advance of the United States in the nineteenth century, they largely

² Raymond F. Dasmann, “Toward a Dynamic Balance of Man and Nature,” *The Ecologist* 6, no. 1 (January 1976), 3; Dasmann, “National Parks, Nature Conservation, and ‘Future Primitive,’” *The Ecologist* 6, no. 5 (June 1976), 164-67.

withdrew from Glacier and their role in the ecosystem greatly diminished. The state of nature that Americans sought to preserve at the beginning of the twentieth century was already missing a key constituent.



1.2 Indian Use and Occupancy

The earliest record of human presence in what is now Glacier National Park dates to about 10,000 years ago. A single Clovis spear point found in the Belly River area is evidence that Paleo-Indian big-game hunters inhabited the region at the end of the last ice age. As the climate became warmer and drier, other Paleo-Indian cultures appeared. The first, known as the Lake Linnet Complex, probably centered in the Intermountain West and was drawn to the Glacier area for the resources found on the east side of the mountains. The next, known as the Cody Complex, originated on the southern plains and exploited the bison. A third tradition, the Red Rock Canyon Complex, followed a pattern of seasonal rounds that included hunting for bighorn sheep and bison on the east side, camping at the foot of the large lakes on the west side, and hunting and quarrying at higher elevations in between.³

The development of more effective hunting weaponry, particularly the atlatl or throwing stick, marks the transition to the Archaic or Middle Precontact Period of North American prehistory. In the Glacier region, Archaic peoples employed new strategies for hunting bison, including surrounds and buffalo jumps. Fishing intensified. About 5000 years ago, hunting and gathering cultures in the area of Glacier National Park began setting fire to the grasslands and forest understory in order to influence wildlife productivity. This is known from the detection of higher levels of charcoal in pollen samples taken from the bed of Lake Linnet in the Waterton Valley.⁴ More than any other

³ Brian O. K. Reeves, "Native Peoples and Archaeology of Waterton Glacier International Peace Park," in *Sustaining Rocky Mountain Landscapes: Science, Policy, and Management for the Crown of the Continent Ecosystem*, edited by Tony Prato and Dan Fagre, 43-45, (Washington: Resources for the Future, 2007).

⁴ Reeves, "Native People and Archaeology of Waterton Glacier International Peace Park," 46-47.

tool, fire was an effective means by which early peoples shaped the natural environment to suit their needs.

About 1600 years ago, the introduction of the bow and arrow and pottery brought further marked changes in Native American cultures. In the Glacier National Park area these technological advances resulted in significant shifts in the pattern of seasonal rounds. Resident peoples spent less time in the mountain valleys and alpine zones and more time in the surrounding foothills and plains. The bison resource became more of a focus, while fisheries on the east side received less use. West side and east side cultures became more differentiated.⁵

In the early 1700s, European influences began to have profound effects in the region. Horses, introduced by the Spanish in Mexico, were traded northward until they arrived in the northern plains. Guns, introduced mainly by the French and English in the fur trade, came from the east about the same time. As the Plains Indian culture acquired horses and guns, the buffalo hunt acquired greater significance and tribes grew more nomadic. Horses and guns augmented the military power of some tribes over others and made the Plains Indian culture more warlike. The more well-armed and warlike tribes pushed for more territory and as a result of this warfare tribal territories gradually shifted westward. By about 1750, the Nitsitapii (or Blackfeet), who had once lived in what is now Saskatchewan, had attained a dominant position on the northern plains in the area of what is now Alberta and northern Montana. Groups that had once ranged on both sides of the mountains, the K'tunaxa (ancestors of the K'tunaxa Nation in British Columbia as well as the Kootenai of Montana), Pend d'Oreilles (also known as Kalispel), and Salish (also known as Flathead), made their homes in the mountain valleys in what is now British Columbia and western Montana. While the high mountain ranges along the Continental Divide formed a protective rampart between the homelands of the Blackfeet and western tribes, the latter would make spring and fall expeditions to the plains to hunt buffalo, using the mountain passes in what is now Glacier National Park (as well as north and south of the park) to go back and forth. The Blackfeet guarded these passes to protect their territory and occasionally they ambushed the western tribes' hunting parties.⁶

The terms Nitsitapii and Blackfeet, while interchangeable in some contexts, do not necessarily refer to the same two entities. The Nitsitapii, which were known to white

⁵ Reeves, "Native People and Archaeology of Waterton Glacier International Peace Park," 48-49.

⁶ Michael P. Malone, Richard B. Roeder, and William L. Lang, *Montana: A History of Two Centuries*, rev. ed. (Seattle: University of Washington Press, 1991), 11-16; C. W. Buchholtz, *Man in Glacier* (West Glacier: Glacier Natural History Association, Inc., 1976), 4-6.

people as the Blackfoot Confederacy, comprised three tribes: the Kaina (Blood), the Siksika (Blackfoot) and the Pikuni (Piegan). Eventually, the Piegan were split into north and south groups by the international boundary. The Kaina, Siksika, and North Piegan now make their homes on reserves in Alberta; the South Piegan or Blackfeet reside on the Blackfeet Reservation east of Glacier National Park. The tribes continue to have strong cultural ties to one another across the international boundary. Thus, while the Blackfeet of Montana have had the most direct involvement with Glacier National Park since its establishment, all the Nitsitapii tribes have a historical connection to the area.⁷

Among the western tribes, the K'tunaxa or Kootenai are similarly ranged on both sides of the international border, with bands now residing in British Columbia, Washington, Idaho, and Montana. Their ancestral homeland centered on the Kootenai and Columbia rivers in British Columbia but extended over the mountains to the upper Saskatchewan River. The Kootenai moved south into the Flathead Valley in relatively recent times. The Pend d'Oreilles and Salish are closely related linguistically and both tribes combined elements of plains and plateau Indian cultures. All three groups allied with each other in defense against the Blackfeet in the 1700s and early 1800s and now form the Confederated Salish and Kootenai Tribes of the Flathead Reservation.

In the 1790s and 1800s, the tribes located around Glacier began to come in contact with European and American fur traders. The powerful Blackfeet tribe inhibited fur traders in the upper Missouri River basin until the 1830s. On the west side of the Continental Divide, meanwhile, the Kootenai, Pend d'Oreilles, and Salish tribes became unwitting partners in the near total destruction of beaver populations. Competition between upstart American fur companies and the Hudson's Bay Company led the latter to employ a strategy of deliberate over-harvesting of fur resources in order to protect its monopoly position farther north and west. Hudson's Bay Company brigades went around the eastern borders of the Columbia District, including the Flathead Basin, with the aim of wiping out beaver populations and creating a "fur desert" that would hold their American competitors at bay.⁸

By the mid-nineteenth century, the tribes located around Glacier were under duress. European diseases to which Native Americans had no natural immunity had swept through these tribes in a series of devastating epidemics starting in about 1730. Missionaries had come to challenge their native religions, and American settlement had

⁷ Mark David Spence, *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks* (New York: Oxford University Press, 1999), 72.

⁸ John S. Galbraith, *The Hudson's Bay Company as an Imperial Factor, 1821-1869* (Berkeley: University of California Press, 1957), 89.

begun to encroach upon their hunting grounds. In 1853, the United States government sent a representative, Governor Isaac Stevens, to make treaties with the various tribes of Washington Territory (which included western Montana) and induce them to settle on reservations. In a treaty council held near present-day Missoula in 1855, Stevens convinced tribal leaders of the Kootenai, Pend d'Oreilles and Salish tribes to cede their aboriginal territory and accept a reservation in the Flathead Valley. Their ceded territory included the west side of the future Glacier National Park. Two months later, Stevens held a treaty council with the Blackfeet tribe. According to the Blackfeet Treaty of 1855, the tribe ceded the southern part of its aboriginal territory in exchange for a large reservation in northern Montana east of the Continental Divide. The reservation included the east side of the future park. The Blackfeet Treaty also provided for a common hunting ground located in southwestern Montana that the Blackfeet would share with western tribes.⁹

In the following decades, as non-Indians rushed to Montana's gold fields and built up herds of cattle and sheep on the open range, the Blackfeet tribe was unable to hold onto all of its large reservation. Weakened by disease and war, its economy shattered by the extermination of the buffalo (which disappeared from the northern plains in the early 1880s), the tribe was forced to part with additional pieces of territory. By 1888, the Blackfeet Reservation had dwindled to its present boundaries on the east, north, and south, while it still extended to the Continental Divide on the west. Historian Mark David Spence describes the tribe's relationship to what would later become the east side of Glacier National Park:

Making up the western portion of the reservation, the mountains remained an important part of Blackfeet life, and most families located themselves in small communities near the foothills. During the painful adjustment to reservation life, the Blackfeet developed a new dependence on the [future] Glacier area that allowed them to maintain older traditions and ameliorate the loss of others. Though no longer able to hunt bison, for instance, young men could still prove their worth as they sought out deer, elk, sheep, and small game in the mountains. Women supplemented meager government rations with the traditional foods and herbs they gathered in the alpine environments, and healers collected and tended medicinal plants. In the midst of pervasive Americanization programs, the Blackfeet also turned to the shelter of the Backbone of the World to hold

⁹ Buchholtz, *Man in Glacier*, 23-24.

prohibited ceremonies. Likewise, young traditionalists maintained their connections with the past by fasting in the same remote locales as their forebears. The mountains also provided the resources that made the incorporation of new skills and livelihoods possible. Along with firewood and lodge poles for tepees, high-elevation forests became an important source of timber for the construction of cabins, fences, and corrals. The foothills sheltered some of the best pasturage for new herds of livestock, and the Indian Service tapped into lakes and streams to create a series of irrigation projects.¹⁰

Contemporary observers of Blackfoot culture in the late nineteenth century tended to slight the tribe's cultural, spiritual, and economic connections to the mountains, emphasizing instead its orientation to the plains. Those same misperceptions were mirrored with regard to the western tribes, whose use of the mountains certainly diminished as a result of changes wrought in the contact period, but nonetheless remained stronger than contemporary observers reported. To some extent, historians repeated those misperceptions through most of the twentieth century.¹¹

Insofar as Indian use of the park area actually diminished from previous levels in prehistory, archeologist Brian O. K. Reeves suggests that the Indians' partial withdrawal from some areas may have triggered significant ecological changes in the last one to two centuries before the creation of Glacier National Park. He speculates, for example, that the Indians' abandonment of fisheries on the east side may have been the cause of a "superabundance of large-sized lake trout" reported in the Waterton Lakes at the end of the nineteenth century. He suggests, further, that Indians on the west side may have curtailed their practice of setting fires when they shifted territories and lost so many people to epidemics, with the result that areas such as the North Fork of the Flathead River grew dense with timber.¹²

¹⁰ Spence, *Dispossessing the Wilderness*, 76.

¹¹ Reeves, "Native Peoples and Archaeology of Waterton Glacier International Peace Park," 40. Reeves cites the examples of two historic resource studies prepared for Glacier National Park in 1970 and 1980, as well as Buchholtz's *Man in Glacier*. Another example is found in the environmental statement accompanying the park's wilderness proposal. "The area now called Glacier National Park was marginal in the lives of the various tribes which lived on both sides of the Continental Divide. No tribe actually inhabited the park, but are thought to have utilized trails and passes in the park when traveling to prairie hunting grounds." (Glacier National Park, Midwest Region, National Park Service, Department of the Interior, *Final Environmental Statement, Proposed Wilderness Plan, Glacier National Park, Montana* (Washington: National Park Service, 1974), 14.

¹² Reeves, "Native Peoples and Archaeology of Waterton Glacier International Peace Park," 52. Meanwhile, Blackfoot resource use on their diminished reservation lands became so intense that by the starvation winter of 1883-84 there was hardly a four-legged animal to be found. This ecological disaster on the Blackfoot Reservation no doubt had lasting repercussions for fauna and flora on Glacier's east side.



1.3 Scientific Exploration

Scientific exploration of the Glacier National Park region began in the 1850s. What distinguished these exploring expeditions from previous travels by Indians and fur traders was their organized, methodical nature. They were made with a view toward garnering knowledge about transportation routes and the agricultural and mineral potential of neighboring lands. At minimum these expeditions produced a map and a report; in some cases they included an artist or naturalist who made sketches and collections. They represent a first effort toward a scientific resource inventory of the area.¹³

When Isaac Stevens led an expedition to Washington Territory in 1853, his first aim was to survey a northern transcontinental railroad route through the Rocky Mountains and the Cascades. While at Fort Benton on the Upper Missouri, Stevens interviewed a Piegan chief about the route now known as Marias Pass. After moving his camp to the Bitterroot Valley, Stevens sent an engineer, A. W. Tinkham, north to locate Marias Pass from the west side. Tinkham hired a Salish Indian scout and journeyed up the Middle Fork of the Flathead River. The scout led him up Nyack Creek and over Cut Bank Pass, which Tinkham mistook for Marias Pass. Tinkham reported to Stevens that it would not be possible to build a railroad over it. Not convinced that Tinkham had found the lowest pass, Stevens sent another subordinate, John Doty, to search for Marias Pass from the east side. Starting from Fort Benton in the following spring, Doty's expedition found the east side approach to Cut Bank Pass, but not the approach to Marias Pass. As

¹³ On the differences between expeditions of discovery and scientific exploration, see William Goetzmann, *Exploration and Empire: The Explorer and the Scientist in the Winning of the American West* (New York: Alfred A. Knopf, 1966), x-xii.

the mountains were still snowbound, Doty explored alternative openings in the Front Range to the north, visiting St. Mary Lake and Chief Mountain.¹⁴

The Stevens expedition raised the stakes of British-American rivalry along the 49th parallel, resulting in a handful of British, Canadian, and American expeditions to the area within the decade. The British North American Exploring Expedition, under the leadership of Captain John Palliser, started from eastern Canada in the spring of 1858 and explored the area that would become Waterton Lakes National Park, together with the Chief Mountain and Boundary Mountains areas of Glacier, in the fall of 1858. Palliser was followed by the Canadian team of S. J. Dawson and George Gladman, whose aim was to survey a route for a Canadian railroad from Lake Superior to the Rocky Mountains. Then came two international boundary surveys, one American and the other British, which entered the area in 1860 and 1861 respectively.¹⁵ Finally, there were parallel British and American surveys in 1874, pursuant to the Treaty of Washington of 1871, which had settled certain disputes concerning the international boundary.

In 1881, Henry Villard, president of the Northern Pacific Railway Company, financed an expedition to the Northern Rockies headed by Raphael Pumpelly. Its purpose was to survey the mineral and agricultural resources of the territory to help guide the location of branch lines for the future transcontinental railroad. Pumpelly made two expeditions into what is now Glacier. On the first, in 1882, Pumpelly approached the mountains from the east and made two tries at crossing the Continental Divide, the first by way of Cut Bank Pass and the second by way of Two Medicine Pass. It was too early in the season and Pumpelly's men found that "a great thickness of snow covered valleys and crests." On his second expedition, in 1883, Pumpelly started from the Flathead Valley and went up the Middle Fork and Nyack Creek, and made a successful crossing of Cut Bank Pass. Pumpelly reported on the glacier that now bears his name, perhaps the first recording of a glacier in the Northern Rockies in U.S. territory. He also claimed to have climbed Mount Stimson, possibly a first ascent. The following year, the Northern Transcontinental Survey came to an abrupt end when the Northern Pacific Railway entered a financial crisis, Villard was forced to step down, and Pumpelly lost his patronage.¹⁶

¹⁴ Buchholtz, *Man in Glacier*, 22-23. Stevens may have been informed of Marias Pass by a map published in 1840 in Robert Greenhow, *Memoir Historical and Political of the North West Coast of North America*. The map showed a "Route across the Mts." at the location of Marias Pass. See Grace Flandrau, *The Story of Marias Pass* (St Paul: Great Northern Railway, 1925), 13.

¹⁵ Buchholtz, *Man in Glacier*, 24-25.

¹⁶ Raphael Pumpelly, *My Reminiscences*, Vol. II (New York: Henry Holt and Company, 1918), 624-625, 632-645.

It remained for a locating engineer of the Great Northern Railway, John F. Stevens, to find the only suitable railroad route over the Continental Divide by way of Marias Pass. The Great Northern Railway, which was to have such a prominent role in the making of Glacier National Park, was under the direction of James J. Hill of St. Paul, Minnesota. Hill had been slowly pushing his lines westward for more than two decades. In contrast to the Northern Pacific, which galloped across the continent on the strength of land grants and speculative financing, Hill built his railroad empire a little at a time, amassing branch lines as well as trunk lines, advancing with the tide of settlement rather than getting too much out in front of it. In 1887, Hill's line reached Great Falls and the search began for a low pass over the mountains. In December 1889, John F. Stevens arrived to take over this reconnaissance.¹⁷

Ironically, after all of the preceding expeditions that had lost their way or had been blocked by heavy snows, Stevens managed to reach Marias Pass on his first attempt with the help of a single Indian guide. Departing from the Blackfeet Agency on a day when the thermometer read forty degrees below zero, the two men proceeded on snowshoes. The guide kept a campfire burning while Stevens covered the final short distance to the pass.¹⁸ Following Stevens' confirmation of the pass, the Great Northern Railway proceeded to build its transcontinental line over the divide and down the Middle Fork of the Flathead River during the next two years. First the tote road and then the railroad itself provided public access to the Glacier National Park area.



1.4 New Forms of Resource Use

More and more non-Indians explored the Glacier area independently in the latter part of the nineteenth century. The mass movement of non-Indian peoples into the area marked a transition to new forms of resource exploitation. Many of the curious were

¹⁷ Flandrau, *The Story of Marias Pass*, 18-19.

¹⁸ *Ibid*, 20-22.

prospectors. Not all prospectors were wholly committed to finding minerals; Westerners in those years often went prospecting in their time off from paid work, and for many of them the prospecting activity was as much a form of leisure as a way to a living. A prospecting trip in the Glacier area usually meant several days or weeks spent in the backcountry, perhaps with some fishing or hunting thrown into the bargain. Prospectors roamed virtually every area of the park. They discovered traces of copper and other valuable minerals and made some two thousand lode and placer claims. The discovery of an oil seep near Kintla Lake in 1892 caused a flurry of excitement.¹⁹

As areas around Glacier became settled, increasing numbers of non-Indians went into the mountains to hunt and fish for subsistence. Homesteaders in the upper Flathead Valley, for example, enjoyed ready access to the mountains around Lake McDonald. These people tended to regard the wildlife range and fisheries as a local commons. The settlers' idea of hunting and fishing increasingly came in conflict with a recreational view of hunting and fishing which emphasized conservation and the sportsman's code. According to the sportsman's code, a sportsman was bound to respect fish and game laws that set catch limits and bag limits, established rules of fair chase, and instituted other measures to protect fish and wildlife populations from being decimated. But according to the values of the latter group, the competition over the hunter's game pitted local subsistence users against elitist trophy hunters and interlopers. Clashes over these changing values often had overtones of class conflict. The last two decades of the nineteenth century were a time of transition when the sportsmen's view of fish and wildlife conservation began to prevail over the settlers' view of the wildlife range and fisheries as a local commons that ought to remain free from state regulation.²⁰

One of the leaders in the wildlife conservation movement of the late nineteenth century was George Bird Grinnell, a resident of New York and editor of *Forest and Stream* magazine. In 1885, Grinnell visited the Blackfoot Reservation to report on the bleak conditions besetting the tribe. He became captivated by the rugged landscape and the wildlife as well as the Indian culture and returned to the area many times. In 1887, he rambled about the Many Glacier area. That same year, he joined Theodore Roosevelt in founding the Boone and Crockett Club, an organization of sportsmen dedicated to the protection of North American wildlife. In 1891, he explored the mountains around the

¹⁹ Buchholtz, *Man in Glacier*, 33-36.

²⁰ For general context on the clash over wildlife values, see Louis S. Warren, *The Hunter's Game: Poachers and Conservationists in Twentieth-Century America* (New Haven: Yale University Press, 1997), and Karl Jacoby, *Crimes Against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley: University of California Press, 2001). These two books contain case studies involving Glacier National Park and Yellowstone National Park respectively.

head of St. Mary Lake with two other members of the Eastern elite, William H. Seward and Henry L. Stimson. Seward was the grandson of President Lincoln's secretary of state, and Stimson, who was then just graduated from Harvard Law School, would go on to serve as secretary of war under President Taft and again under President Franklin D. Roosevelt during World War II. Like Grinnell, Stimson made several more hunting trips to the area. Mt. Stimson is named for him.²¹

Grinnell, a naturalist, ethnologist, and historian as well as an avid sportsman, wrote about his adventures in a series of fourteen essays in *Forest and Stream*.²² Owing to his familiarity with the area and his good standing with the Blackfeet tribe, Grinnell was asked to serve on a commission in 1895 to negotiate yet another land cession with the tribe. The federal government wanted the tribe to cede the westernmost part of their reservation – from the edge of the prairie to the Continental Divide, or what is now the east side of Glacier National Park and the northeast corner of the Lewis and Clark National Forest – because prospectors could not be prevented from prospecting in the area and the government did not want conflict. Grinnell agreed to serve and was instrumental in extracting an agreement despite the tribe's bitter opposition to it. Tribal leaders finally consented to the agreement because they were in a weak bargaining position; if they did not agree to sell, they faced losing the area anyway. After the Senate ratified the 1895 agreement, Grinnell was concerned that prospectors would cause forest fires in the ceded area. He helped to give the ceded area protection by having it included in the Lewis and Clark Forest Reserve, which President Grover Cleveland proclaimed on February 22, 1897.²³

In years to come, the terms of the 1895 agreement would be a perennial source of friction between the Blackfeet and the Park Service. Future generations of Blackfeet would maintain that the tribe had been swindled. The agreement stated that tribal members retained “the right to go upon any portion of the lands...to cut and remove timber for agency and...personal uses...[and] to hunt upon said lands and to fish in the streams thereof, so long as the same shall remain public lands of the United States.” Two decades later, the federal government would contend that the creation of Glacier National Park terminated these rights, because the ceded area was no longer “public lands” in the sense of being open to public entry for homesteading and other purposes. The tribe would not accept that its rights attached to the ceded area had been terminated. Although

²¹ George Bird Grinnell to L. O. Vaught, February 27, 1919, Folder 5, Box 6, L. O. Vaught Collection, GNP Archives. Also see Donald H. Robinson, *Through the Years in Glacier National Park: An Administrative History* (West Glacier: Glacier Natural History Association, Inc., 1960), 19.

²² Buchholtz, *Man in Glacier*, 30.

²³ Spence, *Dispossessing the Wilderness*, 76-82.

there was precedent in 1895 for understanding the relationship of a national park to public lands in precisely that way (the Yellowstone National Park Act withdrew *those* public lands from settlement, occupancy or sale, for example) the record of negotiations suggests that the Blackfeet did not perceive the “public lands” clause in the 1895 agreement in such terms. If Grinnell had any thoughts during the negotiations that the ceded area might someday be made into a national park, he did not express them to the tribe. Tribal negotiators may have understood the cession to be more in the nature of a mineral lease. They heard Grinnell say to them, for example, that the government would “leave you all the wood you need and take only the rocky ridges.”²⁴

While Grinnell was helping to lay a foundation for recreational use on the east side of the mountains, others were doing the same on the west side of the divide. It began with a handful of homesteaders who trickled into the Lake McDonald area in the early 1890s. Frank C. Geduhn filed the first homestead claim on the shores of Lake McDonald in February 1891. A total of six homestead claims were eventually patented. The other five belonged to Milo Apgar, Charles Howes, Frank Kelly, Denis Comeau, and George E. Snyder. The claims of Kelly and Geduhn were at the head of the lake, those of Comeau and Snyder were on the east side near the upper end, and those of Apgar and Howes were at the foot of the lake. Almost as soon as the homesteads appeared, the area began to attract a few wealthy sportsmen from the East. The first party, arriving in the fall of 1892, included Charles Hallock, owner and publisher of *Forest and Stream*. The homesteaders on Lake McDonald catered to these visitors by offering them accommodations, boat transportation, and guide service.²⁵

Among the early visitors to the Lake McDonald area was Dr. Lyman B. Sperry, a professor from the University of Minnesota. Sperry was fascinated with Avalanche Basin and made several trips into the area. In 1895, he led an expedition comprised of

²⁴ U.S. Senate, *Letter from the Secretary of the Interior, Transmitting an Agreement Made and Concluded Sept. 26, 1895, with the Indians of the Blackfeet Reservation*, 54th Cong., 1st sess., 1896, S. Doc. 118. Proviso is on p. 19. Grinnell quotation is on p. 17. It seems unlikely that Grinnell was thinking about a future national park in 1895. Although Madison Grant would later assert in his essay “Early History of Glacier National Park” that Grinnell originated the idea of a national park during his 1891 trip, Grant was probably in error. Grant’s assertion was based on Grinnell’s account of the trip written in 1892, which was finally published in *Century Magazine* in 1901, and some “rough notes” that Grinnell had sent to Grant on the subject. L. O. Vaught disentangled the history this way: shortly before the article’s publication, Grinnell inserted a final paragraph alluding to the area’s newly protected status as a forest reserve. Even in that added paragraph, however, Grinnell did not suggest a national park. Although Grinnell’s publicity of the area sowed seeds for the park movement, he was not an early exponent of creating a national park. See L. O. Vaught to M. E. Beatty, February 24, 1948, Folder 6, Box 4, L. O. Vaught Collection, GNP Archives. Also see Spence, *Dispossessing the Wilderness*, 80-81, and Warren, *The Hunter’s Game*, 131-33.

²⁵ Jessie Ravage, *Recreational Camps on Lake McDonald, Glacier National Park, Montana* (West Glacier: Glacier National Park, 2006), 4-6.

himself, his nephew, Professor L. W. Chaney of Carlton College, and E. R. Shepherd, a photographer, with the aim of exploring the glaciers and alpine lakes above Avalanche Basin. On their return, he described the party's discoveries for the *St. Paul Daily Globe*, explaining that they had observed the same peaks and glaciers that Grinnell had described as the "Crown of the Continent," having approached them from the opposite side. Sperry predicted that the area would become "one of the most popular of all the grand trips that may be taken in the mountain regions of our great West."²⁶

In 1897, Sperry wrote to the Great Northern Railway's passenger agent, F. I. Whitney, "The woods are full of Glaciers – but they are hard to get at... Good trails in this region will make it a popular resort for campers, climbers, and lovers of science and scenery. The region ought to become a National Park."²⁷ Although the company's reply to this letter is not preserved, Sperry's nephew, A. L. Sperry, later observed, "The Great Northern Railroad was eager to have scenic attractions on its line as Yellowstone was [the] drawing card for the Northern Pacific and Mr. Whitney the General Passenger Agent urged everybody he could to go in to the Lake McDonald territory from Belton."²⁸

Most townspeople in Kalispell in the 1890s and 1900s probably believed, as most Westerners did at the time, that the establishment of a preserve of any kind would lock up natural resources and retard economic development. In 1896, Gifford Pinchot and John Muir visited Montana as part of a commission to recommend forest reserves in the West. Their recommendations resulted in the proclamation of the Flathead Forest Reserve and the Lewis and Clark Forest Reserve, among others, in 1897. A year and a half after the forest proclamations, the *Daily Inter Lake* ran an editorial that ridiculed the forest reserves as "visionary schemes of enthusiasts who knew nothing of the condition of the country in which they were situated."²⁹ But as the trickle of wealthy sportsmen and tourists gradually increased, some in the business community in Kalispell began to see the economic value of preserving scenery. A decade after the forest proclamations, in April 1907, former Kalispell mayor W. C. Whipps, who owned land at the head of Lake McDonald, learned of a plan to cut timber along the shores of the lake. "Immediately there arose in my mind," he later wrote, "visions of ruin and desolation and I at once

²⁶ *St. Paul Daily Globe*, August 23, 1895; A. L. Sperry to L. O. Vaught, October 18, 1946, Folder 7, Box 6, L. O. Vaught Collection, GNP Archives.

²⁷ Quoted in Buchholtz, *Man in Glacier*, 43.

²⁸ A. L. Sperry to L. O. Vaught, October 20, 1946, Folder 7, Box 6, L. O. Vaught Collection, GNP Archives.

²⁹ *Daily Inter Lake*, December 23, 1898, quoted in "Re Creation G N Park," (undated research notes), Folder 6, Box 4, L. O. Vaught Collection, GNP Archives.

determined to do all within my power to save this lovely lake from destruction.”³⁰ Whipps drafted a letter to Montana’s two U.S. senators and went around the town collecting signatures. He collected a dozen signatures, including those of the mayor, the secretary of the Kalispell Chamber of Commerce, the recorder of the U.S. Land Office, and several prominent businessmen. The letter called on the senators to stop the timber sale and consider making the whole mountainous region from Lake McDonald to the international boundary into a national park.

By this time there had been other calls to create a national park. Two influential members of the U.S. Geological Survey, R. H. Chapman and Bailey Willis, having surveyed the area east of the Continental Divide, each recommended that it become a national park. John Muir gave the scenery around Lake McDonald high praise in his 1901 book of collected essays, *Our National Parks*. Grinnell seems to have waited until the area’s mining potential faded before putting his own shoulder to the wheel. In 1905, he wrote to Senator Thomas H. Carter of Montana, urging him to introduce a bill. When he got no response, he urged his friends in Montana to write to their senator. He also stirred interest in the measure by the Boone and Crockett Club and the Appalachian Mountain Club.³¹

The Montana senators introduced a bill in December 1907. As the legislation wended its way through multiple committees and sessions of Congress over the next two and a half years, Montanans appeared to be divided on the issue. The *Missoulian* was supportive. “The time to save it is now,” the newspaper commented, referring specifically to the Lake McDonald area, “before the axe has laid low its dense forests.” The *Great Falls Tribune* was also in favor of a national park, predicting that it would become an economic boon for the people of the Flathead Valley. The *Daily Inter Lake* opposed the measure at first, but changed its position early in 1909. “Many will regret to see that matchless region changed from an untouched wilderness to a resort for tourists,” an editorial explained. “Still it will be of great value to Montana and extracting dollars [through tourism] is apparently much more to the point than keeping a wilderness unspoiled for a few nature lovers.”³²

³⁰ W. C. Whipps, “Glacier National Park,” *Kalispell Water Department Report* (1927), 51-54, copy in Folder 6, Box 4, L. O. Vaught Collection, GNP Archives.

³¹ U.S. Senate, 1908, *To Establish Glacier National Park in Montana*, 60th Cong., 1st sess., Report 580, pp. 4-5; Buchholtz, *Man in Glacier*, 46-47; Gerald A. Diettert, *Grinnell’s Glacier: George Bird Grinnell and Glacier National Park* (Missoula: Mountain Press Publishing Company, 1992), 84-90; Grinnell to Vaught, July 30, 1924, Folder 5, Box 6, L. O. Vaught Collection, GNP Archives.

³² Newspaper editorials are quoted in “Re Creation G N Park,” (undated research notes), Folder 6, Box 4, L. O. Vaught Collection, GNP Archives.

Senators Joseph M. Dixon and Thomas H. Carter acknowledged that the people of the state were of two minds about the park. Dixon had an ear to the ground for changes in public opinion as he stood for re-election in 1908, and he believed that more and more people were coming to support the conservation movement. Carter sought to win local support by adding various provisions to the bill that would allow development and resource use inside the park: salvage logging of dead or down timber, construction of a railroad up the North Fork, development of water storage reservoirs by the Reclamation Service, construction of private summer homes or cottages, as well as the usual provision for construction of park hotels. Furthermore, to assuage fears of homesteaders located along the North Fork who thought the park would result in their eviction from the valley, the legislation protected all valid existing rights of landholders located within the park. Carter even proposed to allow hunting in the park. All except the provision for hunting was allowed to remain in the final legislation passed by Congress in 1910.³³

The Great Northern Railway provided vital support for the park movement. Although whatever lobbying James J. Hill or his people did they did behind closed doors, contemporary observers judged that the railroad's influence was decisive – both in getting Senator Carter on board in the first place and in overcoming lukewarm endorsements that the secretary of the interior and the secretary of agriculture each gave the measure. As soon as President Taft signed the bill into law, the Great Northern Railway went to work planning and constructing visitor accommodations in and near the park.³⁴

Senate and House reports on the legislation described the resources of Glacier National Park as they had been presented to Congress. The area was said to contain some 40 glaciers (the number was raised to 60 in some reports) as well as many mountain lakes and streams, whose waters flowed to three oceans. The rugged topography featured “mountain scenery of unparalleled grandeur and beauty.” The area contained practically no agricultural land or valuable minerals – thus, implicitly, the area could produce more wealth from tourism than from any other form of development. There was an abundance of mountain goat, mountain sheep, elk, deer, moose, and bear, as well as many species of birds. It was believed “these game animals and birds [would] increase in numbers...to

³³ Hillory A. Tolson, compiler, *Laws Relating to the National Park Service, the National Parks and Monuments* (Washington: Government Printing Office, 1933): 138-39; C. W. Buchholtz, “W. R. Logan and Glacier National Park,” *Montana: The Magazine of Western History* 3, no. 19 (Summer 1969): 3-4.

³⁴ Buchholtz, *Man in Glacier*, 47. The letters by the secretaries of the interior and agriculture are printed in U.S. Senate, *To Establish Glacier National Park in Montana*, 60th Cong., 1st sess., Report 580, 1908, pp. 4-5.

furnish in the overflow from the park a tempting supply to sportsmen for all time to come.”³⁵

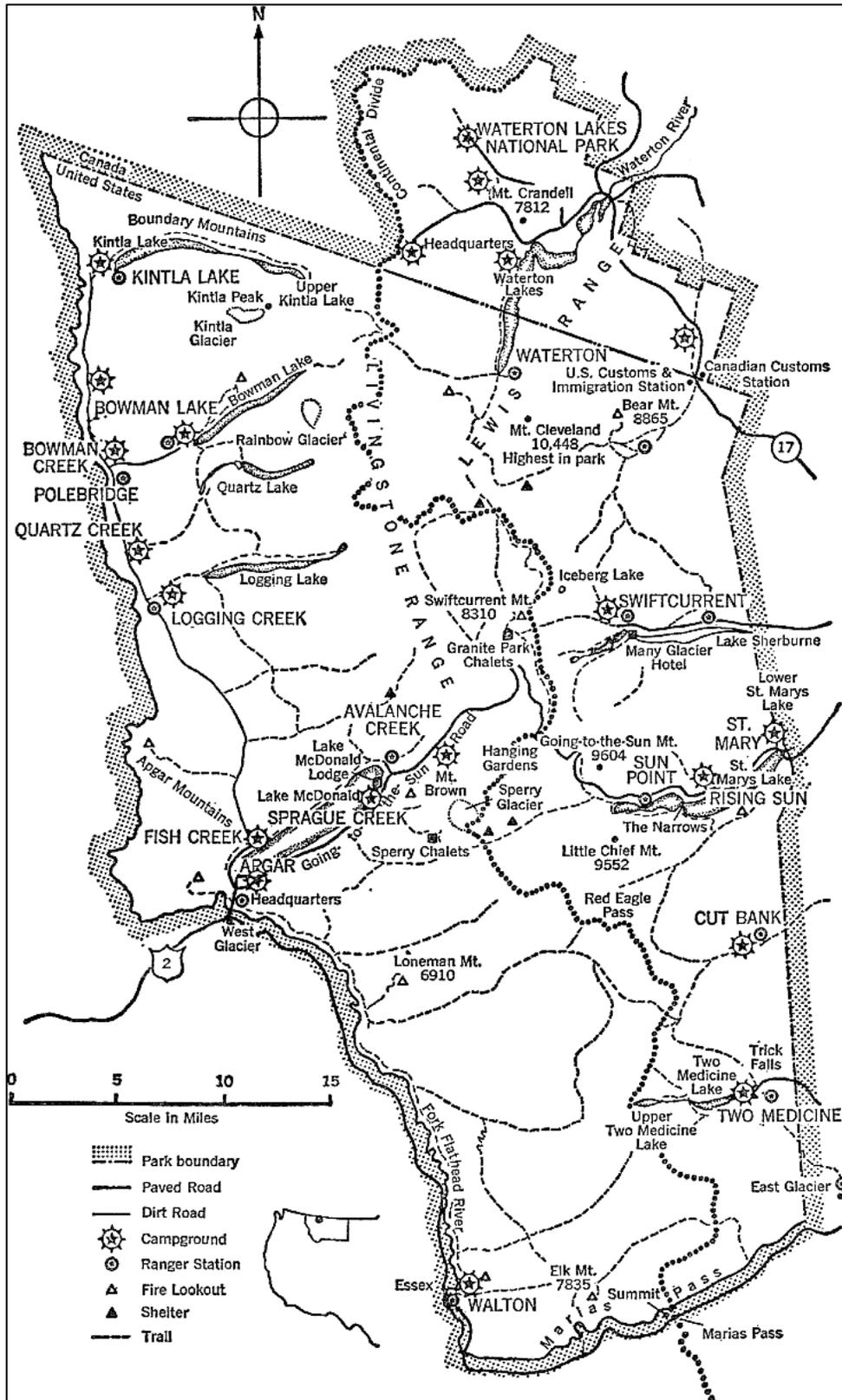
The conception of the national park as a reservoir of game reflects the influence of the Boone and Crockett Club. In the early twentieth century, sportsmen-conservationists looked to the creation of game preserves as the most important thing the federal government could do for wildlife conservation. It was up to the states to enact game laws, but enforcement of state game laws was weak. Federal game preserves – whether in the form of wildlife refuges or national parks – could be patrolled by federal wardens or rangers. As one Boone and Crockett Club publication suggested, “The Club could successfully influence the Federal Government to preserve game under its jurisdiction and once the government has been committed to it, police powers could be obtained for the purpose.”³⁶ Another club book stated, “In such areas....the game will then retain its native habits and breed freely, while the overflow would populate the adjoining districts.”³⁷ There was an assumption that a game population, if relieved of hunting pressure, would grow in much the same way as a herd of domestic livestock. The game sanctuary, according to this logic, would effectively “stock” the range with game animals. Although sportsmen would not be allowed to hunt in Glacier National Park itself, they would benefit because the park would form a source of breeding stock for the surrounding country. This rather simplistic model of wildlife population dynamics would be influential in the park’s early years. It put a heavy emphasis on law enforcement, or the *protection* of resources from prohibited uses. It assumed that if “nature” received appropriate protection, then “nature” would flourish. As will be seen in the next chapter, it put forward a rather selective view of nature, stressing abundance of big game, good fishing, pristine scenery, and living trees.³⁸

³⁵ U.S. Senate, *To Establish Glacier National Park in Montana*, 60th Cong., 1st sess., Report 580, 1908, pp. 1-2.

³⁶ Charles Sheldon, “Big Game in Chihuahua,” in *Hunting and Conservation*, edited by George Bird Grinnell and Charles Sheldon (New Haven: Yale University Press, 1925), 181.

³⁷ Madison Grant, “The Condition of Wild Life in Alaska,” in *Hunting in High Altitudes: The Book of the Boone and Crockett Club*, rev. ed., edited by George Bird Grinnell (New York: Harper and Brothers, 1913), 371-72.

³⁸ Guy Elliott Mitchell, “A New National Park,” *National Geographic Magazine* 21, no. 3 (March 1910): 215-23. Mitchell, a member of the U.S. Geological Survey, amplified on ideas expressed in the Senate and House reports, such as the concept of national park as a reservoir for game and the idea that the area’s economic unimportance helped to make it “an ideal national playground.” The movement to establish Glacier National Park paralleled the movement to establish Mount McKinley National Park (1917). On the latter, see Theodore Catton, *Inhabited Wilderness: Indians, Eskimos, and National Parks in Alaska* (Albuquerque: University of New Mexico Press, 1997), 90-94.



Glacier National Park. Source: William H. Matthews, *A Guide to the National Parks, Their landscape and geology* (Garden City, New York: Doubleday/Natural History Press, 1973).

Chapter 2

A Reservoir of Nature



2.1 A Foundation in Law

Glacier National Park was established by law. It is perhaps an obvious point, but the statutory basis of the national park would henceforth frame all human activity and resource stewardship in the area. People would still respond to the place in personal and emotional terms, but whenever people's ideas about proper use of Glacier's resources came to diverge in significant ways from other people's ideas, the park's federally-appointed caretakers would resolve those differences under the aegis of federal law.

Congress established Glacier National Park by the Act of May 11, 1910. The area was "dedicated and set apart as a public park or pleasure ground for the benefit and enjoyment of the people of the United States." Section 2 of the act placed the park under the control of the Secretary of the Interior and charged him with making rules and regulations "for the preservation of the park in a state of nature so far as is consistent with the purposes of this act." These two juxtaposed statements described the basic challenge of park management. The area was to be preserved, yet it was also to be used. The same dichotomy of purpose would be articulated more famously in the National Park Service Act of 1916, which defined the "fundamental purpose" of national parks to be:

to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.¹

Glacier National Park's establishing act contained several provisions that further qualified how the area would be preserved. Any property holder who held property within the park was protected in the "full use and enjoyment of his land." Railroad rights of way could be acquired through the valleys of the North and Middle forks of the Flathead River. The U.S. Reclamation Service was granted use rights within the area. The Secretary of the Interior could grant leases of land for construction of visitor accommodations (each one not to exceed 10 acres in size and 20 years in duration). Likewise, the secretary could grant leases of land for summer cottages (each one not to exceed one acre and 20 years). Logging of dead or down timber was allowed under permit if it was deemed to be in the interest of protecting or improving the park. These provisions aimed not only at making the park available for recreational use, but also at protecting the economic interests of Montanans.

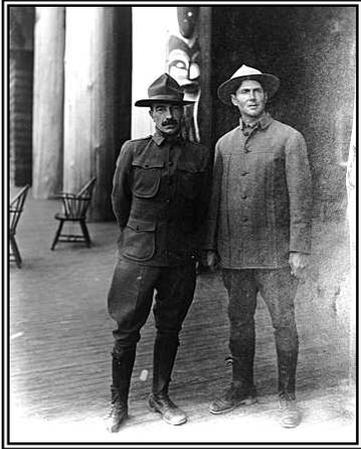
The "preservation" called for in the 1910 act had a different meaning in the park's early years from what it came to mean later on. Natural resources were viewed from an aesthetic, not an ecological, point of view. A beetle-killed patch of trees, for example, was regarded as a visual blight on the scenery without any thought being given to the role of natural insect infestations in forest ecology. "In many places the cutting of fully matured timber will not in the least mar the beauty of the park, but will benefit the growing timber," the park's first superintendent, W. R. Logan, commented in 1911. The park administration erected a temporary sawmill at the park's first headquarters site, Fish Creek Station, and put the entire ranger force to work on the milling operation each May for the next four years. While cleaning up the forest, the sawmill produced some 300,000 feet of sawn lumber and 150,000 shingles, which were used in construction of government buildings.²

Natural resources also tended to be perceived as independent objects rather than as connecting strands in a web of life or components of an ecosystem. Glacier National

¹ Tolson, *Laws Relating to the National Park Service, The National Parks and Monuments*, 10-11; Buchholtz, "W. R. Logan and Glacier National Park," 3-4. The National Park Service Act is quoted in Richard West Sellars, *Preserving Nature in the National Parks: A History* (New Haven: Yale University Press, 1997), 38.

² U.S. Department of the Interior, *Report of the Superintendent of the Glacier National Park to the Secretary of the Interior, 1911* (Washington: Government Printing Office, 1911), 8. Sawmill production is recorded in each annual report from 1912 to 1915.

Park's annual reports listed the park's "wild animals" by species, gave estimates as to their numbers, and commented on how visible they were to park visitors. The annual report for 1917, for example, noted that black bears were "frequent visitors at the construction and tourist camps," whereas grizzly bears were "seldom seen, and scarcely give any trouble."³ Absent from those observations was any concern about the effects of human food and garbage on black bear ecology.



2.2 An Emphasis on Law Enforcement

In the park's early years, resource management revolved around the idea of resource "protection." Forests were to be protected by controlling the spread of wildfires and infestations. Game animals were to be protected by discouraging poachers from coming into the park and illegally taking game. The sanctity of park lands would be protected by preventing trespass of various kinds, whether it was by stock growers who wanted to graze their livestock in the park, or by miners and prospectors who wanted to exploit valuable mineral deposits, or by local residents who wanted to cut timber. Resource protection was mostly a matter of law enforcement. There was a general assumption that if the park could be protected from illegal uses, then nature would mostly take care of itself. While a few sites within the park would be developed for recreational use, the rest of the park would remain in "a state of nature."

With "preservation" largely focused on protecting the area from illegal uses, the park administration gave early attention to marking the park boundary. One of the first actions of the Department of the Interior was to prepare a public notice for posting around the park boundary. Chief Clerk Clement S. Ucker had 500 copies of the notice printed on cloth and sent to Glacier National Park. The notice stated that "hunting, trapping, killing or capturing game animals and birds" was prohibited by the Act of May

³ Glacier National Park, *Annual Report, 1917*, typescript, p. 10, copy provided by GNP Archives.

11, 1910, and that persons violating the law could be fined or imprisoned. Ironically, the public notice was in error, because the 1910 act did not prohibit hunting. The law only provided for the Secretary of the Interior to prescribe rules and regulations for the care and protection of game. Regulations prohibiting hunting were promulgated December 3, 1910. In the meantime, it was decided to post these notices in spite of the fact that they were in error, on the grounds that hunting was prohibited in closed season under Montana law.⁴

As the park approached its first winter, Superintendent Logan recruited a ranger force from among the local population and assigned each of these six “guards” (as he referred to them) to patrol a sector of the park boundary. Mostly these men were there to deter poaching, although Logan anticipated that in a short time the rangers’ duties would also include trail construction and fire control. In 1911, the ranger force was increased to fourteen, and the park administration began building ranger stations at several points around the edge of the park where trespass and hunting violations were considered most likely.⁵

State game officers supported the park’s purpose to protect wildlife, but they were doubtful of the rangers’ abilities to stop poachers. In 1913, the state game warden, J. L. De Hart, caused a flap when he wrote to Secretary of the Interior Franklin K. Lane complaining of the amount of elk being killed illegally in the park. DeHart sent two deputy game wardens to the region and according to their investigative report a total of 19 elk had been poached. Park officials disputed the number, pointing out that a number of these elk had been killed on the Blackfeet Reservation outside the park. But in the midst of these accusations and denials there were other embarrassing revelations. Two of the poachers who had been apprehended by park rangers were themselves rangers on the adjoining Flathead National Forest, and another offender was postmaster in the town of Essex. When one of these cases was taken before a U.S. district judge, the judge ruled that the state, not the park administration, controlled the game in Glacier National Park.⁶

The basis for the judge’s decision, and a factor in the poachers’ disregard for the law, was that most Montanans believed the federal government had not yet established federal law enforcement jurisdiction inside the park. On February 17, 1911, the

⁴ Chief Clerk to Assistant Attorney-General for the Interior Department, September 7, 1910, File 12-14-17, Box 23, Central Files 1907-39, Record Group 79 (hereafter RG 79), National Archives II (hereafter NA II).

⁵ U.S. Department of the Interior, *Report of the Superintendent of the Glacier National Park to the Secretary of the Interior*, 12; Robinson, *Through the Years in Glacier National Park*, 57.

⁶ J. L. De Hart to Franklin K. Lane, December 19, 1913, J. L. Galen to Secretary of the Interior, November 24, 1913, Adolph C. Miller to Galen, December 2, 1913, Galen to Secretary of the Interior, December 5, 1913, Galen to H. E. Vaught, December 16, 1913, and Acting Secretary to Secretary of the Interior, December 18, 1913, File 12-14-17, Box 23, Central Files 1907-39, RG 79, NA II.

Legislature of Montana passed a law ceding to the United States exclusive jurisdiction over Glacier National Park, the cession to take effect when Congress enacted a law to accept it. Representative Charles Nelson Pray (R-MT) introduced the bill, but Congress did not immediately act on it. The delay was offensive to many citizens of Montana, who contended that the federal government had no law enforcement jurisdiction in Glacier National Park until Congress acted. To press their point, some citizens declared their intention to hunt in the park during Montana's open season. While federal authorities denied that Montana citizens had that right, they knew they had a problem of enforcing the law and they were anxious for Congress to pass the legislation.⁷ Congress finally accepted the cession by the State of Montana of exclusive jurisdiction in an act approved on August 22, 1914.

The law made Glacier National Park a part of the United States judicial district of Montana and provided for the appointment of a U.S. commissioner who would reside in the park. The law prohibited hunting in the park and enumerated various offenses that would assist law enforcement in the protection of wildlife. Namely, it made possession of dead animals or animal parts in the park *prima facie* evidence that the person was guilty of violating the law, it prohibited the transportation of dead animals or animal parts that were illegally taken, and it provided for the forfeiture of guns, traps, and other items used in connection with any violation under the act.⁸

The law did not entirely dispel doubts about federal jurisdiction. Much of the ambiguity surrounding the park administration's ability to protect wildlife related to private land inside the park. Could persons hunt on their homesteads inside the park during open season under Montana law? Could they kill game outside the park and haul it across park land to their homestead inside the park? These questions persisted even after the U.S. assumed exclusive jurisdiction. In December 1915, Stephen T. Mather, then serving as assistant to the secretary, requested to be advised on this matter by the solicitor for the Department of the Interior. The solicitor's opinion affirmed that the hunting prohibition covered private land inside the park. Mather then directed the park supervisor to notify all of the settlers inside the park of the Department's position and inform those persons that park rangers would strictly enforce the law. When the settlers were notified, several of them objected and claimed they would hunt on their land

⁷ U.S. Department of the Interior, *Report of the Acting Superintendent of the Glacier National Park to the Secretary of the Interior, 1912* (Washington: Government Printing Office, 1912), 13.

⁸ Tolson, *Laws Relating to the National Park Service, The National Parks and Monuments*, 139-43.

regardless. But following the notification the park administration kept a close watch and found no one violating the law.⁹

The controversy lingered for many more years. Some legal experts in Montana believed that the assertion of federal control over wildlife protection on private land inside Glacier National Park contradicted the doctrine of state ownership of wildlife. They held that there was no authority in the U.S. Constitution for the federal government to assume exclusive jurisdiction over a national park that had been established in a state after the state gained statehood. Mather was less interested in the legal or constitutional argument than he was in having the cooperation of state officials. In 1923, he proposed that any hunting violation committed on private land inside the park would be turned over to the State Department of Fish and Game for prosecution. State Game Warden C. A. Jakways wholeheartedly agreed with this plan.¹⁰

Most of the park rangers were already deputized by the state game warden. In January 1924, park rangers investigated a report that one of the settlers on the North Fork had transported a deer carcass to his homestead from a neighbor's homestead located inside the park. As it was closed season, the deer was poached regardless of where it had been taken. This incident raised the issue of whether a park ranger could legally search a wagon on a park road, since, under the Montana game law, a game warden needed a warrant to search a person's property. Mather sought another solicitor's opinion. The opinion held that in such cases a ranger could not search without a warrant. The opinion reaffirmed, however, that federal regulations concerning wildlife protection did apply on private lands inside the park.¹¹

Still another solicitor's opinion in December 1929 cleared up a final bit of ambiguity that had long proven troublesome for the park administration. Park regulations held that firearms were only permitted in the park on written permission of the superintendent. Did the restriction on possession of firearms apply to persons who resided in the park? Solicitor E. C. Finney found that the restriction applied with equal force for possession of fire arms on park land, park roads, and private land within the park, regardless of a person's place of residence.¹²

⁹ Stephen T. Mather to J. L. De Hart, December 30, 1915, Assistant Attorney to Mather, undated, and S. F. Ralston to Mather, January 17, 1916, File 12-14-17, Box 23, Central Files 1907-39, RG 79, NA II.

¹⁰ J. R. Eakin to C. A. Jakways, September 28, 1923, and Jakways to Eakin, October 1, 1923, File 720, Box 253, Central Classified Files 1907-49, RG 79, NA II.

¹¹ H. W. Hutchings to The Director, January 10, 1924, Stephen T. Mather to the First Assistant Secretary, February 16, 1924, and Arno B. Cammerer to Charles J. Kraebel, April 22, 1924, File 720, Box 253, Central Classified Files 1907-49, RG 79, NA II.

¹² J. R. Eakin to The Director, December 23, 1929, Folder 7, Box 262, GNP Administrative Records 1910-1984, GNP Archives.

Legal questions concerning the prohibition on hunting in the park took a different tack with regard to the Blackfoot Tribe. Along the boundary with the Blackfoot Reservation, poaching took two forms. Some tribal members entered the park, drove the elk or mountain sheep onto the abutting reservation, and killed the animals on Indian land. Others simply poached animals in the park. In either case, the Blackfeet claimed the right to hunt those animals according to their treaty rights. In 1915, Mather requested an opinion as to whether their claims were valid.¹³

Solicitor Preston C. West found that the Blackfoot Tribe's right to hunt in the ceded strip – the area from the present boundary of the Indian reservation to the Continental Divide, which the tribe had sold to the U.S. in 1895 – had ceased to exist when Congress established Glacier National Park. West referred to the Supreme Court decision in *Ward v. Race Horse*, in which the court found that the Bannock Tribe's right to hunt on public lands ceased the moment that the United States parted with the title to those lands. The treaty at issue in that case gave the tribe the right “to hunt upon the unoccupied lands of the United States, so long as game may be found thereon and so long as peace subsists among the whites and Indians on the border of the hunting districts.” In its decision, the Supreme Court described the treaty right as “temporary and precarious” as shown by Congress's subsequent establishment of Yellowstone National Park (just three years after the treaty), which was carved out of those same hunting districts.¹⁴

The solicitor observed that the agreement with the Blackfeet reserved the right to hunt and fish so long as the ceded lands should remain “public lands of the United States.” Reasoning by analogy with *Ward v. Racehorse*, he found that the agreement “contemplated that the right to hunt and fish should cease as the land fell out of the category of public lands.” The act creating Glacier National Park placed the area under the exclusive control of the Secretary of the Interior and authorized him to make rules and regulations “for the care and protection of the fish and game.” Like the Bannock Tribe's hunting right, the Blackfeet's right to hunt under the 1895 agreement was temporary and precarious.¹⁵

Solicitor West's opinion was unequivocal but it was also subtle. Just three months earlier, in September 1915, he had rendered a different opinion concerning the right of Yakama Indians to hunt in Mount Rainier National Park. In that instance, West found that the Yakamas' treaty right endured after the park was created. Explaining the

¹³ Stephen T. Mather to Solicitor for the Interior Department, November 4, 1915, File 12-14-17, Box 23, Central Files 1907-39, RG 79, NA II.

¹⁴ Preston C. West to Secretary of the Interior, January 4, 1916, File 12-14-17, Box 23, Central Files 1907-39, RG 79, NA II.

¹⁵ *Ibid.*

difference, he referred to the Supreme Court decision in *United States v. Winans*. In the Winans case, the treaty right involved the “right of taking fish...in common with citizens of the Territory” and the “privilege of hunting...upon open and unclaimed land.” The Supreme Court found that the treaty contemplated that the lands ceded should be disposed of by the United States, and that the right to hunt and fish would continue after such disposition. The claim by Yakama Indians to hunt in Mount Rainier National Park rested on the same treaty as that in the Winans case, so the right endured in that park.¹⁶

West’s opinion did not impress the Blackfeet Indians, who continued to insist that they had the right to hunt in the east side of Glacier National Park. Indeed, poaching continued on both sides of the park, but the problem was more serious on the east side because the Montana game law did not apply on the Indian reservation and the tribal government was generally reluctant to impose a closed season. As was the case in many national parks, deer and elk in Glacier National Park needed to move to lower elevations on the edge of the park each winter, often moving beyond the sanctuary of the park itself. The elk herd on the east side of Glacier was especially vulnerable as it had to exit the park onto the Indian reservation. Park officials sometimes made recommendations to the Department to get a strip of land added to the east side of the park, or they made overtures to the tribe to close that area to hunting, but usually these initiatives only served to irritate the tribe.¹⁷

Tribal members were not the only ones to take advantage of the elk herd’s need to find winter range. The park’s chief naturalist, Dr. G. C. Ruhle, described how unscrupulous hunters operated on the park boundary. “I have known of so-called sportsmen who linger in a settlement adjoining a park until bad weather forces the unsuspecting and half-tame elk from the safety zone where food is covered by snow,” he wrote. “Those elk are easily slaughtered as if they were domestic cows grazing in a pasture. I have known these same trophy-mongers to entice tame deer across the park boundary with a loaf of bread. These deer, suspecting no evil from hands from which

¹⁶ Preston C. West to Secretary of the Interior, January 4, 1916, File 12-14-17, Box 23, Central Files 1907-39, RG 79, NA II. See also Theodore Catton, *National Park, City Playground: Mount Rainier in the Twentieth Century* (Seattle: University of Washington Press, 2006), 56-58. Solicitor E. C. Finney issued an opinion concerning Glacier in 1932. Finney, like West, found that the Blackfeet right was temporary and precarious and that it ceased when Glacier National Park was established. Finney’s opinion included more analysis on the point that the national park was not the same as “public lands of the United States” as the term was understood in the Blackfeet agreement of 1895. E. C. Finney to Secretary of the Interior, June 21, 1932, Folder 7, Box 262, GNP Administrative Records 1910-1984, GNP Archives.

¹⁷ Franklin K. Lane to Senator H. L. Myers, January 19, 1918, and Lane to W. T. Hornaday, April 19, 1919, Folder 8, Box 245, GNP Administrative Records 1910-1984, GNP Archives; Arno B. Cammerer to Charles H. Burke, December 19, 1924, and Burke to F. C. Campbell, December 27, 1924, File 720, Box 253, Central Classified Files 1907-49, RG 79, NA II.

they had been taught to receive nothing but good, are heartlessly murdered.” Ruhle was quick to add that excess numbers of deer and elk should be hunted, but the hunt ought to occur away from the park boundary under rules of fair chase. “A National Park should serve as a reservoir in which game and furbearers should prosper until they spread out over the surrounding territory where they become legitimate prey,” he wrote in 1931, echoing the ideas of the Boone and Crockett Club conservationists twenty years earlier.¹⁸



2.3 Stocking the Park

While law enforcement was the cornerstone of wildlife protection in the park’s early years, it was not the sum total of it. Park rangers also took part in actions that would be termed wildlife management or resource management in a later era. These actions included one introduction (of Yellowstone elk), artificial feeding (of deer, elk, and bighorn sheep), fish planting in lakes and streams, predator control, and rudimentary efforts to address food conditioning by bears.

In the spring of 1912, one carload of elk was shipped from Yellowstone to Glacier. A ranger from Glacier traveled to Yellowstone and accompanied the captured elk by train back to Glacier. Transportation costs for both the ranger and the elk shipment were shared by the Great Northern and Northern Pacific railway companies. The elk were released on the west side of the park. Rangers subsequently reported that some of the elk moved into the North Fork area while other individuals drifted into the Nyack Creek drainage. There were unconfirmed reports that most of the imported elk left the park at the end of the summer and were shot by hunters. The railway companies offered to ship two more carloads of elk from Yellowstone to Glacier the following year.

¹⁸ G. C. Ruhle, “Sportsmen,” *Glacial Drift* 14, no. 9 (September 1931), 64.

However, since the first introduction appeared not to have met with success, the second shipment was not made.¹⁹

Introductions such as this one were a common technique of wildlife conservation in the early twentieth century. The railroads participated in shipments of bison, elk, deer, and mountain goats. It was part of a broad effort to “restock” wildlife ranges and restore wildlife populations to their former condition of abundance wherever possible. Often such introductions were made without much thought of whether the species was native to the area or without any real knowledge of local wildlife range conditions. Not surprisingly, the elk introduction in Glacier proceeded without prior study of habitat suitability or range conditions. Superintendent J. L. Galen simply stated as “fact” that the park had “ample range for quite a considerable number [of] additional elk.” Biological controls were minimal. After the Yellowstone elk were captured, they were found to be carrying the parasitic tick *Dermacentor albipictus*. The Bureau of Animal Industry was consulted. The bureau could not say what effect the ticks might have on other domestic and wild animals, nor could it suggest any practical means of removing the ticks from the Yellowstone elk, so the elk were released in Glacier National Park anyway.²⁰

Railroad shipments of “surplus” animals from Yellowstone to points all over North America continued after the advent of the National Park Service in 1916. As superintendent of Yellowstone National Park and field director for all the western parks in the 1920s, Horace M. Albright supported the wildlife re-introductions. From time to time, he discussed with the U.S. Biological Survey the potential for re-introducing bison in Glacier. However, Albright advised other NPS officials that a bison herd could never be established in Glacier without developing a bison ranch similar to the one in Yellowstone. Consequently, the first step would be to get Congress to appropriate money for construction of buildings and a large fence. Superintendent J. Ross Eakin raised the bison issue in 1922, but there is no evidence that Director Mather ever took it up with Congress.²¹

Senator Peter Norbeck (R-SD) was an enthusiastic proponent of wildlife re-introductions in this era. In 1931, he proposed re-introducing mountain caribou in Glacier. Chief Naturalist Ruhle wrote to Superintendent E. T. Scoyen, “By all means, back this proposition.” Joseph Dixon, a biologist with the National Park Service’s newly

¹⁹ Connie Thompson to H. W. Hutchings, March 22, 1912, and J. L. Galen to Secretary of the Interior, February 13, 1913, File 12-14-17, Box 23, Central Files 1907-39, RG 79, NA II.

²⁰ W. M. Hays to Secretary of the Interior, April 12, 1912, and Superintendent to Secretary of the Interior, January 2, 1913, Folder 8, Box 250, GNP Administrative Records 1910-1984, GNP Archives.

²¹ Horace M. Albright to Arno B. Cammerer, April 18, 1922, and Cammerer to J. R. Eakin, April 20, 1922, File 715-04, Box 252, Central Classified Files 1907-49, RG 79, NA II.

formed Wildlife Survey, also endorsed the senator's proposal. Although caribou were thought to be still present in the park, their future was much in doubt. A park ranger reported seeing one on Starvation Ridge in April 1930, and there were other occasional sightings.²² Perhaps because the park still had a tenuous connection with mountain caribou populations in British Columbia, the caribou introduction never materialized.

Senator Thomas J. Walsh (D-MT) wanted to use Glacier National Park as a source of stock for re-introducing mountain goats and bighorn sheep in the Big Belt Mountains of central Montana. Superintendent Eakin thought it could be done, advising that some sheep could be captured in the Many Glacier area during the winter without great effort. Albright was dubious – both on account of the expense and difficulty involved and because there did not appear to be an excess of animals. Mather held that the NPS lacked authority to make shipments of animals from Glacier; shipments of animals from Yellowstone were covered by a law specific to that park. Senator Walsh offered to get the Yellowstone act amended so as to cover Glacier. Mather asked the U.S. Biological Survey to advise on the proposed legislation, and Chief Paul G. Redington responded that it would be an “excellent plan,” since it would be non-binding, allowing the NPS to decide when the park had “surplus animals.” Mather and Albright remained unconvinced, and the senator never introduced the amendment.²³

As the frequent use of terms such as “surplus” and “stocking” might suggest, wildlife managers in the early twentieth century believed that under controlled conditions deer and elk populations would expand to the full carrying capacity of the wildlife range and more or less stabilize at an optimum level.²⁴ Wildlife managers had little conception of the fact that wildlife populations naturally fluctuate through cycles of abundance and scarcity. Comparing deer and elk herds with livestock herds, wildlife managers thought they could stock the range more effectively by supplying deer and elk with hay and alfalfa. “Artificial feeding,” as this practice came to be known, would also tend to hold

²² E. T. Scoyen to The Director, April 21, 1931, and Joseph Dixon to The Director, April 20, 1931, File 715-04, Box 252, Central Classified Files 1907-49, RG 79, NA II; G. C. Ruhle, “Mountain Caribou,” *Glacier Nature Notes* 3, no. 5 (May 1930), 38. Ruhle and Dixon both distinguished between “mountain caribou” and “barren-land caribou.” Other contemporary sources used the term “woodland caribou” rather than “mountain caribou.”

²³ T. J. Walsh to Stephen T. Mather, November 29, 1927, Mather to Horace M. Albright, November 30, 1927, Mather to Chief, Bureau of Biological Survey, November 30, 1927, J. R. Eakin to The Director, December 5, 1927, Paul G. Redington to The Director, December 7, 1927, and Albright to The Director, December 9, 1927, File 715-04, Box 252, Central Classified Files 1907-49, RG 79, NA II.

²⁴ In 1924, Park Naturalist Morton J. Elrod predicted that populations of bears and wild ungulates in Glacier National Park would grow at a prodigious rate over the next dozen years and attain an optimum level that would be four to five times their present level. (Morton J. Elrod, “Mammals of Glacier National Park,” [1924], Folder 9, Box 17, Series IV, Collection MSS 486, Morton J. Elrod Collection, K. Ross Toole Archives, Mansfield Library, University of Montana.)

deer and elk in the park in the winter when they might otherwise stray out of the park and get shot.

The practice of purchasing hay to feed deer in Glacier began about 1918. During the unusually severe winter of 1924-25, Superintendent Charles J. Kraebel purchased four and a half carloads of hay to forestall a heavy loss of deer from starvation. The following year, before the onset of winter, Kraebel purchased five carloads of hay and had it delivered to feeding grounds near Belton Station as a precautionary measure. Seeing where this was leading, Mather balked at the deer feeding program because of its obvious artificiality. However, Albright suggested an argument for the deer yards that Mather found persuasive. The deer yards would tend to draw the deer away from homesteads located along the North Fork and Middle Fork where they were apt to be shot.²⁵

By 1930, rangers counted as many as 500 whitetail deer utilizing the various deer yards. Mule deer did not feed on the hay, although they did come to the yards for the salt licks. (Possibly the mule deer found the hay unpalatable; one criticism of artificial feeding was that artificially fed deer would become malnourished.) The deer yard near Belton Station no doubt led to more deer getting killed by trains. According to the annual game count for 1930, the deer herd decreased by eight percent from the previous year's count. Superintendent Eakin attributed most of the loss to the 85 deer killed on the train tracks during that year.²⁶ At the same time, park officials were glad to see the deer congregate at that place in full view of the passenger trains, which rolled by at a slow speed so that passengers could peer out the windows and view the deer. Superintendent Eakin even changed the time of day that the deer were fed so that the herd would gather shortly before the No. 1 and No. 2 trains went by in the afternoon.²⁷

In Glacier National Park, and indeed throughout North America in this era, wildlife conservation focused unapologetically on game species, primarily wild ungulates. Wildlife was divided into a spectrum of "good" and "bad" animals. Game animals were good, predators were bad. Wildlife managers thought that another way to increase the abundance of game animals was to drive down the number of predators and reduce the amount of predation. Initially, predator control in Glacier National Park was

²⁵ Charles J. Kraebel to The Director, December 29, 1925, Horace M. Albright to The Director, January 6, 1926, and Mather to Kraebel, January 13, 1926, File 720-01, Box 253, Central Classified Files 1907-49, RG 79, NA II.

²⁶ E. T. Scoyen, "Winter Feeding," *Glacial Drift* 4, nos. 2-3 (February-March 1931), 9; J. Ross Eakin, "The 1930 Game Count," *Glacier Nature Notes* 3, no. 5 (May 1930), 43.

²⁷ J. R. Eakin to W. P. Kenney, January 30, 1930, File 715-04, Box 252, Central Classified Files 1907-49, RG 79, NA II.

simply an extension of the wider utilitarian conservation assault on predators. Montana, like other western states, sought to reduce populations of wolf, coyote, and cougar mainly to reduce losses of domestic livestock. Although Congress intended Glacier to serve as a sanctuary for wildlife, the contemporary view was that the sanctuary idea did not include those noxious, predatory animals. With the advent of the National Park Service (NPS), predator control was continued with a view toward building up numbers of deer and elk for visitors to observe and enjoy. Predators, in this context, were seen as a detriment to the public's use and enjoyment of the park. Only in the mid 1920s did some in the NPS begin to question the appropriateness of killing predators in national parks.²⁸

Between 1910 and 1916, the park administration employed a variety of methods for killing wolves, coyotes, and cougars. The superintendent issued permits to landowners in the park to hunt those species. It encouraged rangers to hunt predators during the winter months, and allowed them to keep the pelts for a source of supplemental income. It hired one professional hunter, Ora Reeves, to hunt cougars with dogs. Other initiatives were considered and rejected. The Department of the Interior decided against putting a bounty on coyotes and cougars as it did not want to set a precedent for other national parks.²⁹

Bears were in a category somewhat distinct from predators. They were a visitor attraction, like deer and elk, and they did not kill large numbers of prey. Still, they could be a danger to human life, which meant that park managers had legal authority to kill bears when it was deemed appropriate to do so. In 1914, a number of summer residents at the head of Lake McDonald petitioned the park administration to exterminate bears together with predatory animals. The park administration demurred, especially after it consulted John Lewis, the proprietor of the Glacier Hotel (the future Lake McDonald Lodge), who said that hotel guests enjoyed viewing bears in the vicinity of the hotel. The superintendent decided on a different tack. He stationed a ranger with two bear dogs at the head of the lake, called on the summer residents to incinerate their garbage, and requested Lewis to relocate his garbage dump farther away from the hotel. The

²⁸ Sellars, *Preserving Nature in the National Parks*, 72-74.

²⁹ It also turned down, on advice from the Department of Agriculture, a proposal by Superintendent Galen to inoculate a couple of coyotes with mange and release them in the park with the hope of spreading the disease among the rest of the coyote population. W. W. Hutchings to Secretary of the Interior, February 19, 1912, Connie Thompson to Hutchings, February 24, 1912, and Assistant Secretary to J. L. Galen, January 7, 1913, File 12-14-17, Box 23, Central Files 1907-39, RG 79, NA II; Adolph C. Miller to Galen, November 14, 1913, File 10, Box 262, GNP Administrative Records 1910-1984, GNP Archives.

Department approved the whole plan, including the purchase of two bloodhound pups for \$25 apiece.³⁰

In 1918, the NPS sought help from the U.S. Biological Survey in destroying coyotes in national parks throughout the West. The initiative came in response to widespread reports that coyote numbers were increasing in the western national parks at an “alarming rate.” It was certainly no coincidence that the call for increased predator control came at the same time that livestock growers pushed for grazing to be allowed in national parks. That summer of 1918 the United States was engaged in World War I in Europe, and livestock interests claimed that the mountain pastures found in national parks were needed for the war effort. The NPS withstood pressure to open the parks to grazing, but it went along with stepped-up predator control.³¹ As a result of the region-wide initiative, Glacier received a pair of trappers from the Biological Survey during the winter of 1918-19. Working mostly in the North Fork area, they killed 79 predators. No permanent record of the various species was kept. Of the 79 predators taken, the hides of 73 were sold at auction through a St. Louis furrier, netting the park \$627.43 for the lot. The remaining six pelts were turned into the Biological Survey.³²

In Glacier, as in other national parks, predator control efforts reached a climax over the next few years. Park rangers received training by an expert from the Biological Survey, and at least one ranger was tasked during the winter months to hunt cougars with dogs as well as trap coyotes. The park employed experienced trappers, paying them \$10 per month and pelts. The list of noxious predators was expanded to include martin, mink, weasel, and lynx – evidently with a view to making small mammals and songbirds more abundant and visible.³³

In the mid 1920s, a few people began to raise doubts about predator control. Academics working in the new field of animal ecology were one source of criticism. Land managers working in the NPS and the U.S. Forest Service were another.³⁴ The

³⁰ J. L. Galen to Secretary of the Interior, March 24, 1914, Lewis C. Laylin to Galen, May 9, 1914, Galen to Secretary of the Interior, June 16, 1914, and Laylin to Galen, June 20, 1914, File 12-14-17, Box 23, Central Files 1907-39, RG 79, NA II.

³¹ Alexander T. Vogelsang to Secretary of Agriculture, July 3, 1918, D. F. Houston to Secretary of the Interior, July 11, 1918, Stephen T. Mather to W. W. Payne, July 19, 1918, Superintendent to The Director, August 8, 1918, Horace M. Albright to Payne November 8, 1918, and Albright to Payne, December 6, 1918, Folder 10, Box 262, GNP Administrative Records 1910-1984, GNP Archives.

³² Glacier National Park, *Annual Report 1919*, typescript, p. 22, copy provided by GNP Archives.

³³ R. B. Marshall to S. F. Ralston, November 21, 1916, and Superintendent to The Director, December 19, 1924, Folder 10, Box 262, GNP Administrative Records 1910-1984, GNP Archives. See also Victor H. Cahalane, “The Evolution of Predator Control Policy in the National Parks,” *Journal of Wildlife Management* 3, no. 3 (July 1939): 229-37.

³⁴ Thomas R. Dunlap, “Wildlife, Science, and the National Parks, 1920-1940,” *Pacific Historical Review* 59, no. 2 (May 1990): 190-91.

latter began to see, on range after range, what could happen if efforts to build up game populations were to continue unchecked. The first such example occurred on the Kaibab Plateau north of the Grand Canyon, where predators were wiped out and the deer herd irrupted in the early 1920s, leading in turn to a sudden deterioration of range conditions and mass starvation among the deer herd. Some land managers tried to draw immediate lessons from the Kaibab disaster, although precisely what had occurred there would be studied and debated for years afterward.³⁵

In the NPS, Superintendent Kraebel of Glacier National Park was among the early critics of predator control policy. “During fifteen years of forest life,” he wrote to Mather in 1927, “I have become convinced of the importance of maintaining the ‘biological balance’ in the fauna of wilderness areas, and nowhere is this more important than in the National Parks which purport to be great museums of primitive natural conditions.”³⁶ Soon Kraebel was corresponding with like-minded people on the subject, including Park Naturalist Floyd Schmoie at Mount Rainier National Park, Barrington Moore of the Ecological Society of America, and Aldo Leopold of the U.S. Forest Service. Leopold, who would write about the Kaibab disaster in his well-known essay, “Thinking Like a Mountain,” was not yet prepared to advocate complete protection of predators in national parks in 1927, but neither did he support a program to exterminate them.

While I favor reasonable control even in the Parks, I distinctly agree that the predatory animal species have the same educational value as the game species, if not more. For this reason, no predatory species should be exterminated, especially in the Parks, and the Parks have a special responsibility in maintaining a productive stock of grizzlies and other species which cannot be maintained in many places outside the Parks for economic reasons.³⁷

Kraebel sent Leopold’s letter to Mather, who sent it to J. Ross Eakin, the former superintendent of Glacier National Park from 1921 to 1924, currently stationed in Grand Canyon National Park. Eakin staunchly supported the current predator control policy of

³⁵ Theodore Catton and Lisa Mighetto, *The Fish and Wildlife Job on the National Forests: A Century of Game and Fish Conservation, Habitat Protection, and Ecosystem Management*, report prepared by Historical Research Associates, Inc., for USDA Forest Service (Washington: Government Printing Office, 1998), 47-49.

³⁶ Charles J. Kraebel to The Director, January 6, 1927, Folder 10, Box 262, GNP Administrative Records, GNP Archives.

³⁷ Aldo Leopold to Charles J. Kraebel, January 18, 1927, File 719, Box 253, Central Classified Files 1907-49, RG 79, NA II.

the NPS, which allowed each superintendent to formulate policy according to local conditions. Eakin thought the situations in Glacier and on the Kaibab Peninsula were utterly different. In Glacier, Eakin maintained, predator control efforts needed to focus on protecting the deer around the deer yards. Eakin carried that view with him when he returned to Glacier for a second tour as superintendent from 1927 to 1931. Real change in predator control policy would not come until the 1930s.³⁸

Efforts to stock park waters in the early twentieth century paralleled efforts to stock the wildlife range. There were important differences, however. When Glacier National Park was established, many of its mountain streams and lakes were biologically isolated and contained no fish. Contemporaries referred to such waters as “barren” and set about planting them with fish. Even in those waters that did contain fish, the park administration showed practically no concern over the prospect that introduced species might displace native species. Rather, the park administration focused solely on improving a recreational resource. Another difference between stocking the wildlife range and stocking park waters was that the park administration had less control over the latter. Some fish stocking was done by private individuals acting on their own initiative, and some was done by the Great Northern Railway acting virtually without supervision.³⁹

In 1912, acting superintendent H. W. Hutchings initiated an effort by the federal government to stock Glacier’s lakes and streams. The Department of the Interior turned to the Bureau of Fisheries in the Department of Commerce for assistance. Beginning with a shipment of 14 cans of fish in 1914, the Bureau of Fisheries began to supply fish for stocking park waters. The park received shipments of 63 cans in 1915 and 142 cans in 1916. The effort vastly increased after the construction of the Glacier Park Fish Hatchery in 1918. The hatchery was expected to produce 2.5 million fry per year.⁴⁰

The plan was for the hatchery to supply five species of fish for stocking park waters, only one of which was native to park waters. Besides the native blackspotted

³⁸ J. R. Eakin to Director, February 9, 1927, File 710, Box 252, Central Classified Files 1907-49, RG 79, NA II.

³⁹ Robert C. Wasem, “A Brief History of Fish Management in Glacier National Park,” June 1964, typescript, George C. Ruhle Library, GNP.

⁴⁰ The fish hatchery was located on land donated to the government by the Glacier Park Hotel Company and built by the Bureau of Fisheries in cooperation with the NPS. It consisted of one building and 32 troughs, each trough measuring 16 feet by one and a half feet. The water supply running through the troughs was fed by Midvale Creek. U.S. Department of the Interior, *Report of the Superintendent of the Glacier National Park to the Secretary of the Interior, 1914* (Washington: Government Printing Office, 1914), 8; U.S. Department of the Interior, *Report of the Superintendent of the Glacier National Park to the Secretary of the Interior, 1915* (Washington: Government Printing Office, 1915), 10; Glacier National Park, *Annual Report 1916*, p. 12, and *Annual Report 1918*, pp. 13-14, typescripts, copies provided by GNP Archives. Also see U.S. Department of the Interior, *Reports of the Department of the Interior for the Fiscal Year Ended June 30, 1918*, vol. 1 (Washington: Government Printing Office, 1919), 875-76.

trout (*Salmo mykiss*), the other four species were rainbow trout (*Salmo irideus*), eastern brook trout (*Salvelinus fontinalis*), Montana grayling (*Thymallus tricolor montanus*) and steelhead trout (*Salmo gairdneri*). Plans for the future also included propagation of lake trout (*Christivomer namaycush*) and whitefish (*Coregonus clupeiformis*) in park waters. As soon as the new fish populations were established, eggs for the hatchery were to be obtained from park lakes. Thinking of the park's aquatic habitat strictly in terms of its potential to support a recreational fishery, Superintendent Walter W. Payne wrote, "There is no reason why, under the proper system of development, the waters of Glacier National Park should not contain the best fishing on earth."⁴¹

While the NPS and the Bureau of Fisheries proceeded with their plan to develop park waters for recreational fishing, other efforts were also underway. The Great Northern Railway was the first to get into the act. Without consulting the park superintendent, the company requested fish for planting in park waters from the Montana State Board of Fish and Game. The State Board was happy to comply with the request, delivering 20,000 brook trout in June 1912 and another 50,000 "native" trout in September 1912. The first shipment was planted by the company in Upper Two Medicine Lake, the second in Swiftcurrent Lake. Another shipment of 140,000 grayling was made the following July and was planted in Upper Two Medicine Lake. As reported to Superintendent Galen in November 1913 by the state fish commissioner, still another shipment of 20,000 brook trout was made by the State Board to the Great Northern Railway representative for planting somewhere in park waters, but the state fish commissioner knew not where.⁴² The park administration was not very concerned apparently. Significantly larger plants were made in the following years. It was probably in this period that kokanee salmon became established in Swiftcurrent and Josephine lakes.⁴³

During the 1920s, some 1.5 to 3 million fish fry from the hatchery were planted in park waters each year. Annual reports made a record of how many fry of each species were planted in particular lakes and streams. In 1922, Chinook salmon were planted in McDonald Creek. Superintendent Eakin, an enthusiastic angler himself, was a strong promoter of the development of this resource. In 1923, Eakin reported: "All barren lakes have been stocked with the exception of some inaccessible lakes that will probably never be reached by tourists." In 1929, Eakin announced another "great stride" in the

⁴¹ Glacier National Park, *Annual Report 1918*, pp. 13-14, typescript, copy provided by GNP Archives.

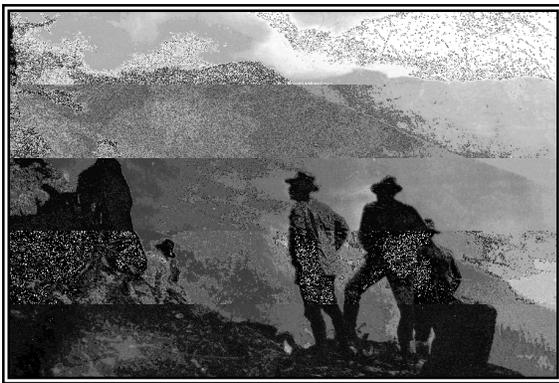
⁴² H. D. Dean to J. L. Galen, November 25, 1913, File 12-14-17, Box 23, Central Files 1907-39, RG 79, NA II.

⁴³ Robert C. Wasem, "A Brief History of Fish Management in Glacier National Park," June 1964, typescript, George C. Ruhle Library, GNP.

development of the fishery with the installation of fish racks and traps in Apgar and Fish creeks where spawn were collected for the hatchery at Glacier Park Station. Eight more rearing ponds were added to the hatchery as the hatchery operation moved toward being “self-supporting,” with spawn collected entirely from park waters.⁴⁴

Soon after the park was established, the Department of the Interior took steps to ensure that park fisheries would be exploited for recreational use only. Park regulations prohibited taking fish by any means other than rod and line. The regulations also imposed a catch limit of 20 fish per person per day. Fish smaller than eight inches in length were to be spared if possible and returned to park waters.⁴⁵

The park administration made an exception to the prohibition on fishing with nets in 1913 when it gave permission to the Glacier Park Hotel Company to catch up to 35 pounds of whitefish daily from St. Mary Lake using a seine net for serving guests at Going-to-the-Sun Camp and St. Mary Camp. The permit was revoked at the end of the summer for failure to attend the net. Permission to catch limited quantities of whitefish with a seine net was granted to the hotel company again in 1917, this time in Lake Sherburne as well as St. Mary Lake. The practice was allowed to continue into the 1930s.⁴⁶



2.4 Balancing Preservation and Use

Congress clearly recognized that it was creating a contradictory mandate or inherent tension for park management when it established Glacier National Park as a preserve of nature and also dedicated it as a “pleasure ground” or recreational area. The tension was implied in Congress’s direction to the Secretary of the Interior to make rules

⁴⁴ Glacier National Park, *Annual Report 1922*, 11, Glacier National Park, *Annual Report 1923*, 7, and Glacier National Park, *Annual Report 1929*, 11, typescripts, copies provided by GNP Archives.

⁴⁵ “General Regulations of March 30, 1912,” in U.S. Department of the Interior, *Report of the Acting Superintendent of the Glacier National Park to the Secretary of the Interior, 1912* (Washington: Government Printing Office, 1913), 20.

⁴⁶ Robert C. Wasem, “A Brief History of Fish Management in Glacier National Park,” June 1964, typescript, George C. Ruhle Library, GNP.

and regulations “for the preservation of the park in a state of nature *so far as is consistent* with the purposes of this act.”⁴⁷ Park managers would eventually deal with this contradiction by citing the need for “balance.” The challenge of finding an appropriate balance between preservation and use would become a large concern later in the park’s history. It was not as pressing in the park’s early years.

One reason why park administrators did not belabor the tension between preservation and use in this era was that they responded to a strong political consensus that the park should be developed as rapidly as possible for the benefit of visitors. W. R. Logan’s first official title was “superintendent of roads and trails.” Logan worked with a team of Interior officials to devise the park’s first development plan. At a projected cost of \$2 million, the plan called for an extensive system of roads and trails, fire lookouts, hotels, and other improvements.⁴⁸ The plan’s authors were not concerned about cutting up wilderness or creating conditions that could lead someday to visitor impacts on park resources. What most concerned Logan and his superiors was how to make the area accessible for visitor enjoyment. As historian C. W. Buchholtz has observed, “Logan resolved the conflict between preservation and use of a national park in his own mind by emphasizing the area’s role as a public recreation area, not just as one reserved for natural phenomena.”⁴⁹

Road construction was a high priority for Logan’s successors as well. On the west side, road building crews began by constructing a road from Belton (West Glacier) to the foot of Lake McDonald (Apgar). By 1916, work was proceeding on a dozen separate road projects – some located outside the park but under park supervision.⁵⁰ In the same period, the Great Northern Railway erected large hotels at Midvale (East Glacier Park) and Lake McDermott (Many Glacier). John E. Lewis, who owned property near the head of Lake McDonald, built the “Glacier Hotel” where George Snyder had earlier established a small hotel and cabin camp, forming the complex now known as Lake McDonald Lodge. While road and hotel development proceeded apace, they were not the only forms of visitor accommodations. By the end of the park’s fourth summer season, the Great Northern Railway’s subsidiary, Glacier Park Hotel Company, was operating tourist camps at St. Mary, Cut Bank, Two Medicine, Many Glacier, and Going-to-the-Sun on the east side, as well as Sperry, Granite Park, and Gunsight camps in the heart of the park. The latter camps could be reached on horseback using the park’s

⁴⁷ 36 Stat. 354. Emphasis added.

⁴⁸ Buchholtz, *Man in Glacier*, 53. Also see Ethan Carr, *Wilderness by Design: Landscape Architecture & The National Park Service* (Lincoln: University of Nebraska Press, 1998), 156.

⁴⁹ Buchholtz, “W. R. Logan and Glacier National Park,” 17.

⁵⁰ Glacier National Park, *Annual Report 1916*, 4.

rapidly expanding trail network. There was boat service on Lake McDonald and St. Mary Lake, and numerous licensed saddle and pack transportation outfits operating in the park.⁵¹

The number of visitors grew annually, reaching a total of 22,449 in 1920, and 73,776 in 1930. Although these totals were small by later standards, they were large enough to cause significant visitor impacts to resources. One of the most conspicuous visitor impacts in this era was from horse use. In 1914, the park was host to no fewer than 23 saddle and pack transportation companies with a combined total of 720 horses.⁵² In 1915, the largest of the operators, Wilbur N. Noffsinger of Kalispell, formed the Park Saddle Horse Company and bought out most of his smaller competitors. Noffsinger's company would be the horse concession in Glacier for the next 25 years and in its heyday it would have 1000 horses in the park. The concessioner kept most of the horses at Lake McDonald Lodge, East Glacier Park, Going-to-the-Sun, and Many Glacier, with the largest concentration at Many Glacier. At night, the horses were turned out to graze. Other places where horses were frequently allowed to graze included the Cut Bank valley, Belly River valley, St. Mary and Two Dog Flats, Rising Sun, and Red Eagle valley. When grazing became scarce, the company fed its horses with hay. Overgrazing was most apparent around Many Glacier and probably impacted bighorn sheep in the area. Horses were also hard on trails. Every horse used in the park was shod on all feet. The horses were taken from place to place almost daily, with or without riders. As visitor demand was never the same from place to place in the park, strings of riderless horses were frequently seen "deadheading" over park trails to wherever demand was currently greatest.⁵³

Taking over administration of the park in 1916, the NPS continued in the utilitarian vein of emphasizing development of recreational assets over preservation of nature. But under Mather's dynamic leadership, the NPS carefully honed how park managers would approach conflicts between preservation and use. It did so by emphasizing aesthetics – treating nature as an object of public enjoyment rather than an organic, functioning system. Instead of attempting to maintain truly natural conditions, historian Richard West Sellars writes, "it sought to present to the public an idealized

⁵¹ *Report of the Superintendent of the Glacier National Park to the Secretary of the Interior, 1913* (Washington: Government Printing Office, 1914), 6-10.

⁵² *Report of the Superintendent of the Glacier National Park to the Secretary of the Interior, 1914* (Washington: Government Printing Office, 1914), 6.

⁵³ Morton J. Elrod, "Let's Go Horseback," *Glacial Drift* 5, no. 1 (January-February 1932), 3. See also "Guide to the Park Saddle Horse Company Records, 1915-1947," at <http://nwda-db.wsulibs.wsu.edu> <January 6, 2010>.

setting of tranquil, pastoral scenes with wild animals grazing in beautiful forests and meadows bounded by towering mountain peaks and deep canyons.” Sellars has described this approach as a kind of “façade management.” The key to façade management was the equation of nature with scenery. As long as a park’s scenery remained unimpaired, park managers could reasonably claim they were preserving the park in a state of nature.⁵⁴

There remained the problem of developing a park’s infrastructure in such a way that it did not impair scenery. Mather’s solution to the problem was to place the design of park roads and buildings in the hands of professional landscape architects. With a proper sense of aesthetics, roads and buildings could be designed to harmonize with the landscape, enhancing rather than detracting from the scenery. Thus, the project to construct a road from Lake McDonald over the Continental Divide to the east side of the park acquired an added dimension. It was not just to be an engineering feat but also an aesthetic challenge. Construction crews used minimum charges of dynamite, disposed of rubble where it would be inconspicuous, and spared trees and other aesthetic features wherever possible. When Going-to-the-Sun Road was completed from Lake McDonald to Logan Pass in 1928, the scar from the road-cut along the Garden Wall had been minimized, and the entire road could be justified on the grounds that it presented one of the most scenic drives in the world.⁵⁵

Landscape architects enjoyed an enormous influence on national park design in the 1920s and 1930s, and their mark on the developed areas of Glacier was profound. Not only were park roads designed to lay lightly on the land, they were located to make the driving experience pleasurable. At strategic locations, trees were removed from the roadside to afford unexpected views in a practice known as “vista clearing.” Fringes along the roadway were seeded with grass to create the feel of a parkway. Guardrails were made of handsome stonework. All of these features would weigh in the decision, more than a half century later, to treat Going-to-the-Sun Road as a valuable cultural property and designate the entire road corridor first as a historic district, and then as a national historic landmark and a national engineering landmark. Insofar as landscape architects were able to define the preservation of nature in Glacier as a matter of aesthetic design, their ideas became embedded in the park’s development areas, particularly the

⁵⁴ Richard West Sellars, “Manipulating Nature’s Paradise: National Park Management under Stephen T. Mather, 1916-1929,” *Montana: The Magazine of Western History* 43 (Spring 1992), 6.

⁵⁵ Carr, *Wilderness by Design*, 175.

main road corridor, in ways that would continue to influence resource management for decades to come.⁵⁶

Besides giving landscape architects a crucial voice in the NPS, Mather introduced another element in national park administration that would be of great importance for the future of resource management. In his first annual report in 1916, Mather stated that “one of the chief functions of the national parks and monuments is to serve educational purposes.”⁵⁷ Gradually a “nature service” or interpretive program was developed in each park. Typically it began as a summer program under the auspices of a professor or high school teacher and grew into a year-round program headed by a ranger-naturalist or chief park naturalist. As parks acquired museums, the chief park naturalist was responsible not only for developing a program of educational services such as lectures, campfire talks, and guided walks, but also for running the museum and managing its collections. As time allowed, or in the off-season once ranger-naturalists became part of the permanent staff, the chief naturalist might work on an herbarium, conduct field studies, correspond with outside researchers, and write or edit nature publications.

Glacier’s first ranger-naturalist, Dr. Morton J. Elrod, was a professor of biology at the University of Montana and a veteran of more than 20 years of field studies in the park area. Elrod made his first trip to the Glacier area in the early 1890s. He founded the Flathead Lake (Yellow Bay) Biological Station in 1899. His second and third trips to Glacier in 1909 and 1910 were both made in the spirit of scientific expeditions, as he and his companions collected plant specimens and photographic images, “prospected” Sperry Glacier, took rock samples from adjacent cliffs, and investigated aquatic life in the mountain lakes. On the 1910 trip, the party of six carried an 11-foot canvas boat, which they used to make soundings and collect micro-organisms in some of the lakes.⁵⁸ Dr. Elrod returned to Glacier nearly every summer after it became a park.⁵⁹ Having spent so much time in the park, he was well qualified to serve as “dean” of the new “nature service” when it was first established in cooperation with the University of Montana in the summer of 1922.⁶⁰

Dr. Elrod was park naturalist from 1922 to 1928. He headed a seasonal interpretive staff of three, usually comprised of himself and two younger professors from

⁵⁶ Linda Flint McClelland, *Building the National Parks: Historic Landscape Design and Construction* (Baltimore: Johns Hopkins University Press, 1998).

⁵⁷ Quoted in C. Frank Brockman, “Park Naturalists and the Evolution of National Park Service Interpretation through World War II,” *Journal of Forest History* 22, no. 1 (January 1978), 29.

⁵⁸ “Botany in Glacier Park,” undated typescript, Folder 7, Box 21, Series IV, Collection MSS 486, Morton J. Elrod Collection, K. Ross Toole Archives, Mansfield Library, University of Montana.

⁵⁹ “The 1929 Ranger Naturalist Staff,” *Glacier Nature Notes* 2, no. 3 (August 1929), 27.

⁶⁰ Glacier National Park, *Annual Report 1922*, typescript, p. 3, copy provided by GNP Archives.

the University of Montana. Dr. Elrod based himself at Many Glacier, while he posted his two assistants at the Glacier Hotel (Lake McDonald Lodge) and Going-to-the-Sun Chalet. The three ranger-naturalists gave evening talks, conducted nature walks, and received visitors at a “nature information desk” set up in the lobby of their respective hotels. Each information desk featured a display of flowers found in the park. While educational work was the main focus of the interpretive program, field study of Glacier’s natural history was a collateral duty. Dr. Elrod made regular observations of Grinnell Glacier, sometimes in company with visiting geologists. Dr. Elrod always concluded the season with a narrative report on his field observations made over the course of the summer.⁶¹



2.5 Forest Protection

When Glacier’s first superintendent entered on duty on August 5, 1910, the Pacific Northwest was a month into its worst forest fire season in history. In Glacier itself, large fires were burning around Kintla Lake and along the Great Northern Railway line east of Marias Pass. Additional fires began or spread into the park in the middle weeks of August. Superintendent Logan promptly improvised a fire fighting organization in cooperation with Flathead Forest Supervisor Roscoe Haines. While Logan took charge of volunteer fire crews in the field, Haines handled the logistics from Kalispell, forwarding men and supplies. In mid-August, six companies of U.S. troops arrived to take over the work from volunteers. Logan put one or two trained civilians with each company of soldiers and based one company at Essex, one near Marias Pass, and four on the North Fork. He established headquarters at the south end of Lake McDonald, from which point he kept in touch with the overall situation and kept the

⁶¹ Morton J. Elrod, “Report of the Park Naturalist, Glacier National Park, 1926,” Folder 5, Box 194, GNP Administrative Records 1910-1984, GNP Archives.

various camps in supply.⁶² Perhaps 60,000 acres burned in Glacier that fearful summer. Forest fires wrought much greater destruction one hundred miles to the west where the maelstrom centered. Altogether the “Big Blowup” burned an estimated three million acres in Idaho, Washington, and western Montana.

The 1910 fire season was a crucible for the fledgling U.S. Forest Service, which had been formed just five years earlier at the urging of Gifford Pinchot, its first chief. According to historian Hal K. Rothman, “Fire became its religion, the way in which the agency defined itself for the next half century. Nothing was more important to the culture of the Forest Service than fire. The Forest Service derived power from its struggle in the summer of 1910 and defined the terms of the battle against fire.”⁶³

The events of the summer stirred debate over how to manage forest fire in the West. A few people advocated “light burning” to keep fuel loads from building up so as to prevent larger conflagrations. Among those who proposed light burning was Pinchot’s nemesis, Secretary of the Interior Richard Ballinger, who noted that setting fires at opportune seasons of the year would follow the tried and true practice of aboriginal Indians. Pinchot and the Forest Service responded to such arguments as heresy. In the end, the Forest Service was able to turn the 1910 fire season into a lesson on why the Forest Service needed to be in the business of all-out fire suppression.⁶⁴

Shortly before Logan set foot in Glacier in that summer of 1910, the Department of the Interior’s chief clerk, Clement S. Ucker, had arranged with the Forest Service to see the new national park through the looming crisis. Congress had made an appropriation of \$15,000 for the first year of park administration, a sum that would have been “used up in the course of a few days” had it been applied to fire suppression.⁶⁵ Ucker’s decision to rely on Forest Service oversight fairly set a precedent for the park administration for the next twenty years. While the park administration subsequently paid for its own expenditures on fire suppression, it usually did so under a supplemental appropriation by Congress in the following year. Neither Congress nor the Department of the Interior would support a large fire organization in Glacier, for it was assumed that the park would get by with Forest Service assistance. At the same time, Congress and the

⁶² Superintendent to Secretary of the Interior, September 14, 1910, Folder 1, Box 304, GNP Administrative Records, GNP Archives.

⁶³ Hal K. Rothman, *Blazing Heritage: A History of Wildland Fire in the National Parks* (New York: Oxford University Press, 2007), 29.

⁶⁴ Stephen J. Pyne, *Year of the Fires: The Story of the Great Fires of 1910* (New York: Penguin Books, 2001), 111-15.

⁶⁵ Ucker quoted in Pyne, *Year of the Fires*, 111.

Department of the Interior expected the park administration to tow the Forest Service line and treat fire as the enemy.⁶⁶

In the aftermath of the 1910 fire season, the Department of the Interior turned to the Forest Service for assistance on other forest management issues in Glacier besides fire control. A portion of the appropriation for the park administration was used to pay salary and expenses of expert lumberman E. S. Bruce of the Forest Service. Bruce made at least two forest inspections in the spring of 1911 and his reports to the Secretary of the Interior were influential. He urged a doubling of the park ranger force, which was accomplished that summer. He prepared regulations for the logging of fire-killed timber, which were promptly put into effect. Bruce reported that the fires in Glacier had not been as destructive as first reported. Much of the timber in the burned areas had survived and a dense growth of grass and wild peas had grown up where fire had run over the ground and removed the duff. This meant there would be more food for deer and elk in the coming years. "Looking at the matter purely from the standpoint of the best interests of the Park," he wrote, "the fires of 1910 have not been such a great injury, since there was formerly a scarcity of winter feed for some species of game on account of the thick growth of forest cover in the bottomlands."⁶⁷

Bruce also prepared a general plan for salvage logging operations in Glacier. To protect the scenic beauty of the park, no logging would be allowed on slopes or high elevations where the cutting would be visible from surrounding points. No logging would be done adjacent to roads or trails, or within 100 feet of lake shores, except in the case of dead or diseased trees. No steam skidding devices or overhead cable systems would be allowed. All logging would preferably be done by animal power, and trees would be selected judiciously so that forest stands would not be thinned too perceptibly. Logging operations would be required to pile and burn brush as part of their cleanup. Bruce cautioned that it would be difficult to get large lumber companies interested in logging inside the park because of these restrictions and requirements; therefore, Interior should be prepared to work with small, local operators to get the salvage logging done.⁶⁸

Interior officials invited another expert, Josef Brunner of the Bureau of Entomology in the Department of Agriculture, to join them on their initial inspection of the new park in the summer of 1910. Brunner showed the party a number of forest infestations, especially in stands of what he described as *Abies balsamea* (balsam fir),

⁶⁶ Rothman, *Blazing Heritage*, 28-31.

⁶⁷ E. S. Bruce to Secretary of the Interior, August 15, 1911, File 12-14-8, Box 42, Central Files 1907-39, RG 79, NA II.

⁶⁸ E. S. Bruce to Walter L. Fisher, April 25, 1911, File 12-14-8, Box 42, Central Classified Files 1907-39, RG 79, NA II.

which were probably subalpine fir. The next spring, Brunner was employed in cutting down infested trees. Logan wanted to salvage those felled trees for lumber, and he used Brunner's work to justify getting a sawmill for the park. At the same time, Logan initiated a handful of small timber sales to dispose of fire-killed timber. After Logan's untimely death in February 1912, subsequent park administrators permitted more small timber sales and continued the sawmill operation. As Supervisor S. F. Ralston explained in March 1916, the small timber sales were made in the belief that the removal of the dead timber reduced the fire hazard and improved the scenery.⁶⁹

While the park administration kept a close eye on salvage logging operations on the west side of the park, it dealt with a different set of circumstances on the east side. The Great Northern Railway Company sought permission to cut down trees for use in constructing hotels and cabins. Logan and Assistant Secretary Connie Thompson visited the site of the company's first logging operation near its Cut Bank Camp in August 1911. Since this logging operation was remote from park headquarters, the two federal officials granted permission for the company to proceed with minimal supervision: the company was allowed to select which trees it would cut, and a ranger would scale logs after the log structures were built. Under these liberal terms, logging operations on the east side proliferated. By 1913, the company was conducting logging operations at numerous locations under a dozen separate authorities. The company was cutting trees and milling lumber from McDermott (Swiftcurrent) Lake in the north to Two Medicine Lake in the south. Some of the company's permits allowed for cutting as much as 1 million board feet of timber; others set no limit. These operations were not only too extensive to be closely supervised on the ground, they also overwhelmed the park administration's accounting system. Starting in 1914, Mather and other Department officials doggedly pursued a full accounting of all the timber cut by the Great Northern Railway. Mather's concern was not just to get the Department's books in order, but to bring these ongoing logging operations under control. For example, the park administration allowed the company to collect firewood around its hotels, cabin camps, and alpine chalets, which led to rapid denuding of the surrounding areas.⁷⁰

⁶⁹ Report of Josef Brunner, August 1910, and W. R. Logan to Secretary of the Interior, June 30, 1911, File 12-14-8, Box 42, and S. F. Ralston to Secretary of the Interior, March 23, 1916, File 12-14-8, Box 43, Central Files 1907-39, RG 79, NA II.

⁷⁰ W. R. Logan to W. J. Hilligoss, August 22, 1911, H.W. Hutchings to Secretary of the Interior, April 6 and 13, 1912, Hilligoss to A. H. Hogeland, May 5, 1912, Assistant Secretary to J. L. Galen, March 6, and September 26, 1913, Galen to Secretary of the Interior, October 20, 1913, S. F. Ralston to Secretary of the Interior, December 24, 1914, Assistant Secretary to J. E. Shoemaker, January 25, 1915, and Assistant Secretary to Ralston, January 25, 1915, File 12-14-8, Box 43, Central Files 1907-39, RG 79, NA II;

Mather also took an interest in what had recently transpired between the park administration and the U.S. Reclamation Service. In 1912, the Reclamation Service requested permission to log a section of forest on the south side of St. Mary Lake from Red Eagle Creek to the outlet, the timber to be used in construction of water storage works connected with the Milk River Irrigation Project. The logging went forward under the supervision of a Forest Service ranger. Approximately 1 million board feet of timber was cut and the logs were skidded down to the lake, rafted across the lake to the outlet, and floated down the St. Mary River from the upper to the lower lake. Since the park's establishing act specifically provided for the U.S. Reclamation Service to make use of the area, the park's administrators were acquiescent. Shortly before his death, Logan assured the supervising engineer, H. N. Savage, that he was "in full accord with any movement that will help curtail the cost of the Milk River project," and other officials took the same passive stand. This logging occurred from 1912 to 1914.⁷¹

Soon after Glacier National Park was established the Reclamation Service also announced its plan to develop a hydroelectric dam at the outlet of McDermott (Swiftcurrent) Lake. As originally planned, the dam would have raised the lake level about eight feet. This plan was subsequently modified. A small hydroelectric facility was constructed below McDermott (Swiftcurrent) Falls, just below the lake outlet, so that the lake level was not changed. (The last remains of this construction were removed in the early 1980s.)⁷²

By the time Mather was appointed director of the new National Park Service, the demand for timber on the east side had largely passed. More than 1 million board feet had already been logged in the vicinity of Swiftcurrent Lake for construction of the Many Glacier Hotel complex. As Superintendent Eakin commented in 1923, there was not much timber in that area left standing. That year, at Mather's request, Eakin urged the hotel company's general manager to move the unsightly old sawmill from Many Glacier to Oldtown near St. Mary Lake, where there was still "ample timber that could be cut without leaving a scar."⁷³ But the company did not heed this request, and Mather, visiting the area two years later, was upset to find the dilapidated sawmill still in the

Stephen T. Mather to Ralston, February 6, 1915, and Supervisor to Secretary of the Interior, February 9, 1915, Folder 1, Box 213, GNP Administrative Records 1910-1984, GNP Archives.

⁷¹ W. R. Logan to H. N. Savage, January 24, 1912, Folder 11, Box 212, and Superintendent to H. N. Savage, February 12, 1914, Folder 1, Box 213, GNP Administrative Records 1910-1984, GNP Archives; Joseph Wright to S. F. Ralston, November 14, 1914, and Stephen T. Mather to Ralston, March 20, 1916, File 12-14-8, Box 43, Central Files 1907-39, RG 79, NA II.

⁷² Jack Potter, comments on draft report.

⁷³ J. R. Eakin to H. A. Noble, December 15, 1923, File 12-14-8, Box 43, Central Files 1907-39, RG 79, NA II.

same place. He directed a couple of rangers to place charges and blow it up; then he told company representatives how to clean up the mess.⁷⁴

On the west side of the park, the NPS removed the government sawmill from Fish Creek but continued to promote salvage logging by small-scale operators. During the 1920s, it dispensed dozens of timber sale permits. Often the permits were simply for the cutting of firewood. In a typical example, Glacier's former clerk and acting superintendent, H. W. Hutchings, a resident of Belton, obtained a permit in February 1926 to cut ten cords of dead lodgepole pine from beside the main park road along the east shore of Lake McDonald. Hutchings was required to cut trees flush with the ground and to pile and burn the debris. His operation was not to obstruct traffic on the road, and he was to stack his cord wood no closer than three feet from the nearest wheel tread.⁷⁵

The fire control organization remained minimal. Glacier's next big fire season occurred in 1919. The park administration threw the entire ranger force onto the fire lines but the large fires were more than the park could handle and the Forest Service was again called upon to assist. After a lightning-caused fire on Adair Ridge blew up and began to spread over a large area, the Forest Service brought in laborers from Whitefish, Columbia Falls, Kalispell, and Great Falls. The force of men numbered as high as 80, and they made some 20 miles of fire lines. On other fires that summer, rangers hastily assembled smaller fire crews from among railroad section men on the Great Northern Railway and road construction crews working on eastside roads on the Blackfoot Reservation.⁷⁶

Paying for fire suppression was a problem. The cost of fire suppression in 1919 came to \$46,000. The next year, it was \$81,849 – more than the entire budget for park administration. Although the park later received \$62,000 in deficiency funds, it was only after months of wrangling and uncertainty. Thus, fire suppression efforts not only diverted the workforce away from other projects (bringing road and trail construction to a standstill, for example) they also played havoc with the next budget cycle. Superintendent Payne argued that Glacier National Park needed a robust fire organization to head off these problems. Congress responded to the situation by adding \$25,000 for fire control to the National Park Service's overall budget. While this yearly increment was better than nothing, it was a paltry sum to cover the entire national park system, and

⁷⁴ Buchholtz, *Man in Glacier*, 61.

⁷⁵ Timber Sale Permit, February 3, 1926, File 884-03.1, Box 255, Central Classified Files 1907-49, RG 79, NA II.

⁷⁶ Glacier National Park, *Annual Report 1919*, typescript, pp. 22-27, copy provided by GNP Archives.

it could only be used for fighting fires, not for fire prevention. It was hardly the kind of pro-active approach to fire management that Payne was calling for.⁷⁷

In 1926, Glacier suffered the worst fires since the landmark fire year of 1910. A prolonged period of hot, dry weather, combined with frequent high winds, led to a rash of forest fires in August. As the fires threatened summer cabin residents on Lake McDonald, some complained that the park administration was not acting aggressively enough to contain them. Among the property owners was Montana's Senator Thomas Walsh, who demanded that the NPS do more. In response, the Department of the Interior sent Horace M. Albright, then superintendent of Yellowstone, to the scene. Albright brought his chief ranger with him and took over direction of the firefighting effort. For ten days there were more than 700 firefighters distributed among 20 camps on the west side of the park.

Superintendent Charles J. Kraebel described the debilitating effects of the firefighting effort in his annual report. "The prodigious task of organizing this large force for effective work and of feeding and supplying it with necessary tools and equipment completely absorbed the energies of the Superintendent and office staff and most of the ranger force during practically the entire park season."⁷⁸ Kraebel argued that the 1926 fire season had proven two things. First, Glacier National Park needed a fire control organization like that of the Forest Service with a network of fire lookouts and an adequate force of patrolmen or "smokechasers." Second, the National Park Service needed "a more elastic authority" for incurring expenses during a bad fire year. The following winter, Kraebel was called to Washington, D.C. for a congressional hearing, and he was able to submit a detailed fire plan for Glacier National Park into the hearing record.⁷⁹

The fires in Glacier in 1926 convinced NPS leadership of the need to commit more resources to control fire in national parks. It marked a critical stage in the agency's approach to fire, much like the great fire year of 1910 had been formative for the Forest Service.⁸⁰ The following year, Mather assigned his chief naturalist, Ansel F. Hall, to the role of NPS forester. At Hall's recommendation, the NPS recruited John D. Coffman to serve as the agency's first fire control expert. Coffman made fire control in Glacier his

⁷⁷ Glacier National Park, *Annual Report 1920*, typescript, p. 19, copy provided by GNP Archives; Rothman, *Blazing Heritage*, 39.

⁷⁸ Glacier National Park, *Annual Report 1926*, typescript, p. 1, copy provided by GNP Archives.

⁷⁹ Glacier National Park, *Annual Report 1926*, typescript, p. 2, copy provided by GNP Archives; Charles J. Kraebel to M. J. Elrod, January 29, 1927, Folder 12, Box 14, Series IV, Collection MSS 486, Morton J. Elrod Collection, K. Ross Toole Archives, Mansfield Library, University of Montana.

⁸⁰ Rothman, *Blazing Heritage*, 45.

first priority; he spent several weeks in the park in 1928 gathering data to develop a fire protection organization, the first of its kind in the national parks. The Appropriation Act for the 1929 fiscal year included \$10,000 for fire control in Glacier, another first. Although this money was originally earmarked for constructing fire lines (similar to past strictures that it should be applied to firefighting, not fire prevention) the NPS decided to reallocate part of the amount for a protective organization during the fire season. The park administration used the allocation to hire four fire lookouts and fifteen fire guards in the summer of 1928.⁸¹

By the following summer of 1929, Glacier National Park's new fire protection organization was fully fledged. Coffman held a fire training school in the park at the beginning of the season. Specialists from the neighboring national forests joined Coffman in providing instruction to the park's fire protection personnel. The organization consisted of the park's permanent ranger force together with a seasonal force of dispatchers, fire lookouts, fire guards, and fire trail crews. The organization was under general charge of the superintendent and under immediate charge of the chief ranger, or "fire chief," whose task it was to direct the organization and keep the superintendent informed of all fire emergencies. Each district ranger had responsibility for fire prevention, detection, and suppression within the ranger district.⁸²

The organization was aimed at rapid detection and suppression of all fires. Lookout stations were situated so that practically the entire area of the park was under surveillance. Some lookout stations had standing structures and others merely had tents, but all were connected by telephone lines to the central dispatcher office at park headquarters. It was the job of the dispatcher to keep a constant check on the location of all members of the protection organization so that when a fire was reported the nearest fire guard or trail crew could be dispatched to the fire. Rangers, fire guards, and trail crews saw to the upkeep of trails and telephone lines to assist in the rapid response. They also maintained caches of fire tools at various locations around the trail system.⁸³

In the first part of the 1929 fire season, the new protection organization suppressed 29 forest fires, containing all but two to less than a quarter acre. One reached an acre and another three acres in extent. Then came the Half Moon Fire. Originating on private land located eight miles outside of the park, ignited by sparks from a wood burning engine on a logging operation, the fire was whipped up by hot, dry winds and

⁸¹ Glacier National Park, *Annual Report 1928*, typescript, p. 8, copy provided by GNP Archives.

⁸² Glacier National Park, *Annual Report 1929*, typescript, p. 13, copy provided by GNP Archives.

⁸³ Glacier National Park, "Fire Control Plan, Glacier National Park, Season of 1929," File 883-01.2, Box 255, Central Classified Files 1907-49, RG 79, NA II.

carried as a crown fire into the national forest and then the national park, crossing the park boundary on August 20. Coffman arrived in the park on August 22 to take charge of the emergency. The rampaging fire swept within a half mile of park headquarters and up both sides of Lake McDonald, blackening two miles of lakeshore. The highly prized cedar forest at the foot of Lake McDonald was reduced to charred poles and snags. Many of the camp cabins and private dwellings at the foot of the lake were destroyed; others lay just outside the path of the fire or were saved by the valiant efforts of local residents. The fires were finally controlled on September 5. In all, about 40,000 acres were burned inside the park. The cost of suppression was about \$120,000. Making a statement about the Half Moon Fire in September, Secretary of the Interior Ray Lyman Wilbur remarked that the fire season of 1929 had taken its place in the history of Montana along with the disastrous years of 1910, 1919, and 1926.⁸⁴

The NPS drew somewhat contradictory lessons from the Half Moon Fire. On the one hand, the fire demonstrated that even a fully-fledged fire protection organization could be overwhelmed. Eakin described it as “a crown fire of the most destructive type and beyond human agency to stop.”⁸⁵ It was only finally contained with the help of September rains. But the more persuasive lesson taken from the Half Moon Fire was that the park was vulnerable to crown fires that commenced outside the park. More must be done to educate the public and involve private landowners in the system of forest protection. Thus, the underlying premise of total fire suppression was upheld.

The Half Moon Fire also provided fodder for another round of discussion about salvage logging in burn areas. Eakin strongly favored a vigorous program of salvage logging in the burn area, believing that the removal of fire-killed trees would reduce the fire hazard, improve the scenic qualities of the park, and make use of the material while it was still merchantable. The Park Service’s chief landscape architect, Thomas C. Vint, recommended against this salvage logging effort. Vint argued that the program could not be justified from an aesthetic or landscape perspective. The damage was too great. A better course would be to treat the area as a “spectacular exhibit of what a forest fire can do and observe how nature handles such a condition.” Coffman suggested that there was another way to manipulate how the forest came back. As the larch and lodgepole seedlings reached a few years of age, they could be thinned by hand pulling in order to obtain a more open forest stand. More fire-resistant hardwoods, such as aspen, alder, birch, and cottonwoods, could be favored as much as possible in the thinning. Such a

⁸⁴ Ray Lyman Wilbur, “The 1929 Half Moon Fire,” *Glacier Nature Notes* 2, no. 4 (September 1929), 35; Glacier National Park, *Annual Report 1929*, typescript, p. 1, copy provided by GNP Archives.

⁸⁵ Glacier National Park, *Annual Report 1929*, typescript, p. 1, copy provided by GNP Archives.

thinning operation would not be practical over an extended area, Coffman suggested, but could be done along the roadway and around development sites. It would result in a more open and attractive and less combustible forest in the future. Eakin took Vint's and Coffman's ideas under advisement and then went ahead with the salvage logging program.⁸⁶



2.6 Properties on Lake McDonald

The Halfmoon Fire, even more than the fires in 1926, highlighted the problem of inholdings around Lake McDonald. The park administration was once again put in a position of defending its firefighting actions with regard to property owners. The property owners at the foot of Lake McDonald complained that they had asked the Park Service for water pumps to save their property and had been refused, all pumps being deployed to save park headquarters. Superintendent Eakin pointed out that if the headquarters had burned up in the conflagration then the whole firefighting effort would have been crippled. Coffman observed that property owners outside the park were responsible for organizing their own volunteer fire protection and property owners inside the park should expect no special privileges. These arguments fell on deaf ears. Eakin reported to the director, “the residents of Apgar are very bitter and thirsting for gore.”⁸⁷

Part of the reason that property owners were so incensed is that many of them believed the park administration had let the fire go so that they would be literally burned out of their inholdings. One property owner, R. E. McDonnell, accused park officials point blank:

⁸⁶ J. R. Eakin to the Director, September 23, 1929, File 884-03.1, Box 255, Central Classified Files 1907-49, RG 79, NA II; Thomas C. Vint to Eakin, October 8, 1929, and J. D. Coffman to Superintendent, December 13, 1929, Folder 4, Box 304, GNP Administrative Records 1910-1984, GNP Archives.

⁸⁷ J. R. Eakin to Horace M. Albright, September 2, 1929, Folder 4, Box 304, GNP Administrative Records 1910-1984, GNP Archives; Rothman, *Blazing Heritage*, 49-50.

The feeling of all of the permanent residents and those who visit the Park seasonally, is that the Government employees are elated over the burning of privately owned cabins and it is commonly charged that the thousands of acres of beautiful timber were sacrificed in order to get rid of the few privately owned cabins.⁸⁸

The government's desire to liquidate these inholdings was well known. One of the fundamental aims of national park policy was to eliminate private landownership inside national parks so as to prevent private commercialization of the public park. The six homesteads around Lake McDonald were a prime example of the threat that such inholdings posed. As Glacier began to be developed, each homesteader subdivided his property into numerous lakefront lots and sold them off to all comers. In 1925, Superintendent Kraebel commented in his annual report, "The unsightly clutter of summer cottages and other buildings, on private lands at the foot of Lake McDonald, which was once one of the most beautiful areas in the Park, is growing worse daily; the land continues to be cut up into smaller lots and to mount in value with each transaction."⁸⁹ By the end of the 1920s, the number of property owners, summer cabins, and guest facilities had multiplied more than tenfold, and among the inholders were both of Montana's two senators, Thomas J. Walsh and Burton K. Wheeler.

Despite the urgency of the problem, the park administration's desire to acquire these inholdings was hampered by two things: the high cost of land and the reluctance to step on individual property rights. In 1917, Congress enacted a law that allowed property owners around Lake McDonald to exchange their land for an equivalent value in timber on national forest lands in Montana, but as the exchange was voluntary this measure did not bear fruit. In 1923, Congress passed another law that allowed these same property owners to exchange their land for public domain land anywhere else in the state, but again there were no takers.⁹⁰ Congress was reluctant to appropriate money for land purchases and it was even more reluctant to use the power of eminent domain – especially since both of Montana's senators were themselves among the inholders. In the late 1920s, Congress instituted a requirement that any use of annual appropriations for the purchase of inholdings in national parks had to be matched dollar for dollar by private sources. In practical terms, this usually meant that the NPS asked landowners to sell

⁸⁸ Quoted in Ravage, *Recreational Camps on Lake McDonald, Glacier National Park, Montana*, Howes' Lake McDonald Cottage Sites Historic District, 8-3.

⁸⁹ Glacier National Park, *Annual Report 1925*, typescript, p. 13, copy provided by GNP Archives.

⁹⁰ John Ise, *Our National Park Policy: A Critical History* (Baltimore: Johns Hopkins Press, 1961), 180.

their inholdings at half their appraised value. Corporations might stand to gain from a public relations angle by parting with their lands in this way, but small land owners had less incentive. So the park administration was stymied, and when the Halfmoon Fire occurred some inholders angrily assumed that park officials had deliberately allowed the fire to rip.

Park officials adamantly denied that they had made any such calculation, but in the months after the Halfmoon Fire the government did proceed to take advantage of the situation. Congress allowed the NPS to expend up to \$200,000 of funds already set aside for land purchases, exempting these funds from the requirement that they be matched dollar for dollar. It did so with the understanding that the NPS would direct those monies to Glacier.⁹¹ In January 1930, park staff made estimates of the value of each separate building at the foot of Lake McDonald. Some of these had survived the fire and some had been hastily erected in the months since the fire. The following summer, NPS purchasing agent F. J. Solinsky, Jr., spent several weeks in the area negotiating land purchases. While some landowners were now willing to sell, many others were not interested as they knew that the charred forest would come back and property values would eventually soar – especially after the Going-to-the-Sun Road was completed. Several landowners wanted to sell if they could retain a life lease. The NPS would not consider that arrangement in this instance. In the end, the NPS purchased 18 lots for \$197,550, while 16 lots in this same subdivision remained in private hands.⁹²

The land purchases made in the aftermath of the Halfmoon Fire had an unintended result. Some property owners sold off their lakeshore lots at a premium price and then turned around and bought lots without lake frontage from their neighbors for less money, using their capital gain to rebuild. As a result, the park administration succeeded in clearing the lakeshore of many buildings only to find many new dwellings and businesses springing up on the other side of the main park road soon thereafter. NPS efforts to acquire these many properties (not just at Apgar but at the upper end of the lake as well) would continue for decades.⁹³

⁹¹ *Congressional Record* 1929, 72, pt. 1, 496.

⁹² Ravage, *Recreational Camps on Lake McDonald, Glacier National Park, Montana*, Howes' Lake McDonald Cottage Sites Historic District, pp. 8-3 and 8-4.

⁹³ Ravage, *Recreational Camps on Lake McDonald, Glacier National Park, Montana*, Howes' Lake McDonald Cottage Sites Historic District, 8-4.

Chapter 3

A Complete Sanctuary



3.1 A Background of Construction

Beginning around 1931, resource management in Glacier National Park was strongly influenced by the new science of ecology. Ecologists viewed organisms in relation to one another. They sought to understand each organism in the context of its total environment or *habitat*. In ecological terms, preserving the park in a state of nature meant keeping the place ecologically whole. Horace Albright alluded to this new conception of purpose when he said that a national park should be a *complete sanctuary*. The phrase carried two meanings. “Complete” could refer to protection, meaning that all species, not just the “good” ones, received sanctuary in the national park. “Complete” could also refer to ecological wholeness, meaning that the ideal of resource management was to preserve the original natural order, or the park’s complete faunal assemblage. Wildlife biologists in the Park Service pushed the latter meaning of complete sanctuary, and to a large degree they succeeded in introducing an ecological perspective in how Glacier National Park was managed. However, as vital as the idea of complete sanctuary would be, it was subordinated to a more pressing national park purpose. That purpose was to develop the park for recreational use. As the park entered an era of major road and campground development, resource management evolved against a background of construction projects.

The central event in the history of Glacier National Park was the development of the spectacular Going-to-the-Sun Road. Threading its way from the shore of Lake McDonald, up McDonald Creek, and along the Garden Wall to Logan Pass on the

Continental Divide, thence down the east side to St. Mary Lake, the road was a feat of engineering and a marvel of landscape architecture. The road secured Glacier's place as a popular resort for automobile-based tourism and made the park a "crown jewel" in the national park system – providing it with a level of visitation and an operating budget to match its outstanding natural resources.

The completion of the Going-to-the-Sun Road brought problems as well as benefits. Historians Lary M. Dilsaver and William Wyckoff contend that the Going-to-the-Sun Road and its associated visitor concentration areas "emerged as a bellwether for traffic and crowding issues throughout the national park system." They maintain that Glacier's managers became enmeshed in a spiral pattern of "cumulative causation" similar to the dynamic observed in urban growth. New infrastructure invited a new level of public use, which led to new environmental stresses. Park managers sought to contain those environmental stresses by the development of more infrastructure, which led to more use, which produced more environmental stresses, and so on. By the end of the period covered in this chapter, the park had taken its modern shape: an oblong block of mostly undeveloped backcountry straddling the Continental Divide, with a "development corridor" cutting across this area like a waistband, flanking the Going-to-the-Sun Road from the west to the east side of the park. Much of the park administration's energies – including those of the resource management staff – would focus on the development corridor.¹

Park managers may not have been able to foresee all the challenges that lay ahead in preserving conditions along this corridor unimpaired for future generations, but they certainly viewed the opening of the road as epochal. As early as the summer of 1929, visitors could drive their private automobiles from the West Entrance to Logan Pass. U.S. Highway 2 over Marias Pass was completed in 1930. Three years later, the Going-to-the-Sun Road was completed between Logan Pass and St. Mary. On July 15, 1933, the park held a dedication ceremony at Logan Pass that drew more than 4,000 people. These developments united the east and west sides of Glacier for the automobile tourist and boosted travel to the park from around 50,000 annually in the late 1920s to around 150,000 annually in the mid 1930s.²

Another significant event with implications for resource management was the establishment of the Civilian Conservation Corps (CCC) in 1933. Conceived by

¹ Lary M. Dilsaver and William Wyckoff, "Agency culture, cumulative causation and development in Glacier National Park, Montana," *Journal of Historical Geography* 25, no. 1 (1999), 76.

² Glacier National Park, *Annual Report, 1933*, typescript, p. 3, copy provided by GNP Archives; Buchholtz, *Man in Glacier*, 59. Visitation round numbers are based on annual visitation statistics at <http://www/nature.nps.gov/stats>.

President Franklin D. Roosevelt as a means for providing unemployment relief while also accomplishing a range of conservation objectives, the CCC lasted through the end of the decade and was finally phased out after the United States entered World War II. Glacier had eight CCC camps through the mid 1930s, and four camps from 1937 to 1942. CCC enrollees greatly augmented the summertime workforce and had a large influence on resource management, particularly fire suppression. During World War II, the Civilian Public Service, an organization that gave conscientious objectors an alternative to military service, had about 150 men in Glacier, providing a diminutive follow-up to the CCC.³

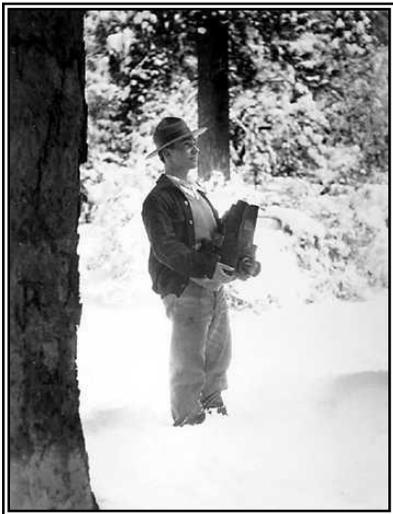
The onset of World War II forms another sharp divide in the park's history. As national priorities changed abruptly and park visitation fell off sharply, the park administration (together with the whole National Park Service) entered upon a period of retrenchment that would extend through the war years, the immediate postwar years, and the Korean War. One effect of retrenchment was the transfer of NPS wildlife biologists to the U.S. Biological Survey. The short-lived NPS Wildlife Division, established in 1933 and dissolved in 1939, introduced a new ecological perspective in resource management. In some ways, the ecological perspective advocated by NPS wildlife biologists in the 1930s were a generation ahead of their time, because neither the Park Service leadership nor Congress would provide the necessary level of support to implement ecological research and monitoring. While the wildlife biologists' ecological perspective was not entirely lost on the Park Service after 1939, it would remain peripheral in the agency culture through the next two and a half decades.

In the annals of national park history, the latter part of the period covered in this chapter is associated with Mission 66, the ten-year construction program that promised to meet rising recreational demand for campgrounds and other visitor facilities throughout the national park system by 1966 – the fifty-year anniversary of the creation of the National Park Service. In Glacier, as in other units, the NPS faced a near crisis as the park's aging infrastructure, suffering from years of deferred maintenance, proved inadequate to accommodate the large demands placed on it during the affluent 1950s. However, public use of the national parks grew even faster in the subsequent decade than Mission 66 planners had projected. As Glacier's visitation climbed from a half million per year in the early 1950s to three quarters of a million in the mid 1960s the "cumulative causation" described by Dilsaver and Wyckoff started to become obvious. To deal with burgeoning numbers at Logan Pass, for example, the park added a modern comfort

³ Numbers of camps are found in the superintendent's annual reports.

station, viewing platform, and nature trail, then a hiking trail to Hidden Lake Overlook, and eventually a visitor center. And the problems at Logan Pass mounted.⁴ The Mission 66 construction program, despite being well-funded, had very little that was specifically aimed at resource management. National conservation groups including the Sierra Club condemned Mission 66 for taking national parks in the wrong direction.

The middle third of the twentieth century saw one other important development for resource management in Glacier National Park. A proposal to dam the North Fork of the Flathead River was the most serious threat among several water development projects located just outside the park's boundaries in the 1940s, 50s, and 60s. Conservation groups, together with the Park Service and the Montana Department of Fish and Game, opposed the Glacier View Dam project. These issues are discussed at the end of this chapter. The park's political maneuvering in response to dam threats laid the foundation for its actions in response to a growing array of "external threats" in the last third of the twentieth century.



3.2 Wildlife Studies in the 1930s

In the late 1920s, wildlife management began to professionalize and coalesce around the academic discipline of ecology. Charles Elton's *Animal Ecology* appeared in 1927, providing a basic textbook for students and popularizing such concepts as the niche and food chain. Aldo Leopold began promoting ideas that he would soon systematize in his seminal work, *Game Management*. The new profession was premised on two revolutionary ideas: first, that all wildlife species were part of an ecological community,

⁴ Dilsaver and Wyckoff, "Agency culture, cumulative causation and development in Glacier National Park, Montana," 87-89.

and second, that managers could improve wildlife conditions by manipulating the environment.

In 1928, George M. Wright, assistant park naturalist in Yosemite, proposed to make the first scientific survey of wildlife conditions in the national parks. Wright was in the Park Service's Education Division, headquartered in Berkeley, California, and he was a student of Joseph Grinnell of the University of California, another leading advocate for science-based wildlife management in the national parks. Wright thought park managers had a glib understanding of how wildlife were actually faring under the Park Service's simple no-hunting regime, and he proposed a system-wide survey to identify "the mainsprings of disorder." Mather authorized the survey, in part because Wright offered to cover expenses using his own private funds. (Beginning with the 1931 fiscal year about half the expenses of the survey were born by the Park Service.) Wright's survey team, which consisted of himself, Joseph S. Dixon, and Ben H. Thompson, surveyed all of the national parks with significant wildlife resources, including Glacier. In the winter of 1931-32, the three wildlife biologists prepared an overview report, *Fauna of the National Parks*, which was also titled *Fauna No. 1* in the expectation that a series of more specialized investigations would follow. The team was known as the Wildlife Survey from 1929 to 1933, and at the end of that period it became the Wildlife Division.⁵

Fauna of the National Parks was a groundbreaking document in the history of NPS resource management. Although it was not as influential as the Leopold Report, which appeared 30 years later, it made some of the same points. Sellars writes that *Fauna of the National Parks* marked "the threshold to a new era" because it defined "unimpaired" in essentially ecological terms and forged "a revolutionary change in the understanding of national parks by Service professionals."⁶ It swept away old conceptions of wildlife as a mix of "good" and "bad" animals and treated wildlife instead as an "assemblage" of species governed by ecological relationships. In this view, all native species deserved protection. National parks stood alone as the only wildlife sanctuaries with complete protection.⁷

The authors of *Fauna of the National Parks* recognized a basic conflict in park management: efforts to preserve natural conditions were often confounded by efforts to

⁵ Dunlap, "Wildlife, Science, and the National Parks, 1920-1940," 195; George M. Wright, Joseph S. Dixon, and Ben H. Thompson, *Fauna of the National Parks*, in *America's National Park System: The Critical Documents*, edited by Lary M. Dilsaver (Lanham, Maryland: Rowman & Littlefield Publishers, Inc., 1994), 104-10; Sellars, *Preserving Nature in the National Parks*, 87; James Pritchard, *Preserving Yellowstone's Natural Conditions: Science and the Perception of Nature* (Lincoln: University of Nebraska Press, 1999), 77, 86-87.

⁶ Sellars, *Preserving Nature in the National Parks*, 98.

⁷ Although "total protection" was the ideal, an exception was made for recreational fishing.

provide access and services for large numbers of people who came to enjoy the area. This underlying conflict produced “a very wide range of maladjustments.” Besides these problems, park land areas seldom conformed to natural biological units, and as a result animals ranged in and out of each park. (Typically, park boundaries took in summer range for ungulates but failed to include winter range. The seasonal movement of elk back and forth between Glacier National Park and the Blackfoot Reservation was a classic illustration of a problem found in other parks as well.) The authors also pointed out that land uses predating the establishment of parks still had lasting effects for wildlife in many parks. Parks were also missing certain wildlife species that had been wiped out before the area was protected. In short, wildlife conditions were not reflective of a pristine state of nature.⁸

The wildlife biologists argued that protection was not a sufficient policy. Mere protection might be effective if the goal of park management was simply to stock the park with “good” animals, but the wildlife biologists proposed a more ambitious aim. The NPS should attempt to restore the wildlife ecology of each area to a close approximation of what it was like before non-Indian settlement and industrialization swept over the region. It was a goal that could never be perfectly attained, but it could be approached. It would require manipulation and, most critically, it would require extensive ecological research. The wildlife survey was only a first step. The wildlife biologists advocated a “program of complete investigation, to be followed by appropriate administrative action.”⁹

The NPS leadership embraced the Wildlife Division’s goals in theory, but it did not grapple realistically with the level of effort required to do ecological restoration. In Office Order No. 266, issued March 21, 1934, Director Arno B. Cammerer announced that the Wildlife Division would guide the Park Service’s “enlarged activity” in wildlife conservation. In each park, the superintendent would designate a certain ranger or rangers to conduct a wildlife investigation and coordinate with experts in the Wildlife Division. The Wildlife Division’s suggested policies, which were distilled into 20 recommendations at the end of *Fauna of the National Parks*, were reproduced in full at the end of this order under the heading “National-Park Policy for the Vertebrates.”¹⁰ The

⁸ Sellars, *Preserving Nature in the National Parks*, 96-97.

⁹ Wright et al., *Fauna of the National Parks*, 106. The authors wanted a “complete faunal investigation” to be conducted in each park and they offered a template of how it should be done. Each investigation would involve four steps: determine the primitive faunal picture, trace the history of human influences, make a thorough zoological survey, and formulate a wildlife administrative plan.

¹⁰ Office Order No. 266, March 21, 1934, Folder 2, Box 258, GNP Administrative Records 1910-1984, GNP Archives.

20 items included the policy that any management action with a potential effect on park fauna would require prior field investigation by a wildlife technician – a foreshadowing of the environmental assessment of later years. While all of this suggests that a significant advancement in wildlife policy was taking place, what actually occurred was heavily lopsided as superintendents supported only those initiatives that did not require much outlay of funds for ecological research.

In Glacier, the Wildlife Division advanced four major initiatives following its preliminary survey. The first was to call for protection of predators, including fish-eating birds even when their feeding was at cross purposes with fish planting efforts. Mergansers were the main point of contention, for they were thought to be taking a heavy toll on fingerlings as they were released in Lake McDonald. Wright argued that the mergansers should not be destroyed to protect the artificially planted fish fry. Superintendent E. T. Scoyen disagreed, citing the difficulty of explaining that position to the average citizen and tax payer. Director Albright weighed in with Wright, saying that the Park Service must “champion the right of fish-eating birds to exist within the park.” It was the function of a national park to provide a complete sanctuary for all forms of wildlife, Albright insisted. Albright had already made a similar statement published in the *Journal of Mammalogy* in May 1931. By the mid 1930s the Park Service had practically eliminated killing of predators in the national parks.¹¹

The second initiative was to end artificial feeding of deer, elk, and bighorn sheep. Wildlife management professionals had by now condemned the practice of artificial feeding because it had been shown that grain-fed wild ungulates suffered malnutrition. In the case of deer, artificial feeding also caused the animals to bunch together unnaturally in the deer yards, making them easy prey. In Glacier, there was also a problem that when the animals congregated in the deer yards, many more were killed by passing trains. Superintendent Scoyen spoke for his rangers as well as himself when he advised a sportsman’s club in Troy, Montana: “Do not start to feed your deer. Our experience has shown that this will do nothing except harm to the animals themselves. In the areas where we are feeding deer at the present time, we feel that we have the lion by the tail and would gladly turn loose if we dared to.”¹² But Scoyen shared a concern with other

¹¹ H. C. Bryant to Superintendent, November 20, 1931, E. T. Scoyen to The Director, January 21, 1932, and Horace M. Albright to Superintendent, February 10, 1932, File 720-04, Box 253, Central Classified Files 1907-49, RG 79, NA II; Victor H. Cahalane, “The Evolution of Predator Control Policy in the National Parks,” *Journal of Wildlife Management* 3, no. 3 (July 1939), 235-36; Dunlap, “Wildlife, Science, and the National Parks, 1920-1940,” 197.

¹² E. T. Scoyen to E. A. Woods, March 12, 1935, Folder 6, Box 262, GNP Administrative Records 1910-1984, GNP Archives.

game managers that to cut off the supplemental feeding too suddenly would cause starvation. Sympathetic to their concerns, the wildlife biologists recommended that artificial feeding be phased out rather than terminated abruptly. The only disagreement was over how fast it should be done.

In the winter of 1933-34, the park fed 27 tons of alfalfa to deer, 25 tons of timothy to elk, and 18 tons of slough grass to bighorn sheep.¹³ In February 1935, in response to a recommendation by the Wildlife Division that the park stop feeding, Chief Ranger Thomas E. Whitcraft suggested that the rangers “gradually pinch down on the feeding” over the next five to eight years.¹⁴ Scoyen chose a middle road: he cut the amount in half in 1936 and curtailed it altogether the next year. Rangers monitored the deer closely, even collecting 75 stomachs to analyze what the deer were eating. In the springtime of the first year that the deer were left to fend for themselves, park staff agreed that the deer seemed to be better off.¹⁵

In a third initiative, the Wildlife Division proposed to re-introduce caribou and bison in Glacier. One of the 20 policy goals set out at the end of *Fauna of the National Parks* concerned re-introductions and was stated as follows: “That any native species which has been exterminated from the park area shall be brought back if this can be done, but if said species has become extinct no related form shall be considered as a candidate for reintroduction in its place.”¹⁶ Ben H. Thompson researched the ecology of the mountain (woodland) caribou in the Northern Rockies and investigated the feasibility of importing stock from Canada. However, the proposal fizzled for lack of interest. The plan to re-introduce bison had greater appeal since the animals would be highly visible to the public. Both the superintendent and the director were interested. But who would pay for it? Albright thought the best hope was to find a philanthropic individual who would underwrite it.¹⁷

Wright’s idea was that the park should partner with the Blackfeet Tribe in this project. The bison, like the elk, would require winter range outside of the park area. To try to maintain a bison herd inside the park year round would be to create a very unnatural situation. (The wildlife biologists were certain that bison had once been at least a summertime resident of the park area; Dixon had proof of this in a bison skull and leg

¹³ Glacier National Park, *Annual Report, 1934*, typescript, p. 14, copy provided by GNP Archives.

¹⁴ Thomas E. Whitcraft to Rangers Newbury, Fladmark, Buchanan, February 15, 1935, Folder 6, Box 262, GNP Administrative Records 1910-1984, GNP Archives.

¹⁵ Glacier National Park, *Annual Report, 1936*, typescript, p. 18, copy provided by GNP Archives; H. Frank Evans, “Bighorn at Many Glacier,” *Glacial Drift* 10, no. 1 (January 1937), 3.

¹⁶ Wright et al., *Fauna of the National Parks*, 110.

¹⁷ H. C. Bryant to the Superintendent, November 20, 1931, and George M. Wright to The Director, February 19, 1932, File 720-04, Box 253, Central Classified Files 1907-49, RG 79, NA II.

bones he discovered on the shore of Red Eagle Lake.) Wright proposed that the nucleus of a bison herd could be obtained from Yellowstone, and that the herd would range in the park during the summer and on the Indian reservation in winter. When the herd was on the reservation, the tribe would be responsible for managing it and harvesting a portion of the yearly increase.¹⁸

Wright understood that wildlife policy could not drive social policy. He correctly observed that the Blackfeet Tribe must have its own cultural and economic reasons for establishing a bison herd on the reservation, and it was not the Park Service's place to recommend policy for the reservation – for the obvious reason that the Park Service had a bias toward how such a thing would play for the tourist. The potential that Blackfeet Indians might be put on display in a new kind of Wild West Show was evident in Wright's description of the project for Albright when he suggested that the Park Service could perform “a wonderful service to the country in helping to rehabilitate the Indians.” Wright continued: “This really means that these Indians would find the chance to stand on their own feet again through a restoration of conditions to which they are suited and under which they were eminently successful. Their ultimate assimilation would be postponed for many years. Moreover, if the National Park Service is to effectually perform its function of maintaining, for all time, respective sections of primitive America, it is logical that the Indians should be included in that scheme.”¹⁹

Curiously enough, Wright's proposal was reminiscent of the famous remark offered by nineteenth-century artist George Catlin, which is often cited as the earliest expression of the national park idea. Catlin, painting scenes of Indians and buffalo hunts as he traveled up the Missouri River in 1832, and perceiving that the Plains Indian culture would soon be challenged by the advancing frontier of agricultural settlement, felt moved to implore that the U.S. government take some protective action to establish a “*nation's Park* containing man and beast, in all the wild and freshness of their nature's beauty!”²⁰ There is no evidence that Wright was familiar with Catlin's proposal. Yet precisely one hundred years after Catlin penned his prescient remark, Wright had somewhat the same notion – albeit modified to fit its twentieth-century context. In February 1932, he wrote to Albright: “Experience has proven that the white man's civilization does not suit the Blackfeet. They were nomads following the buffalo, and their temperament is unsuited for farming. With one experiment a failure, why not try another to see what could be

¹⁸ George M. Wright to The Director, February 2, 1932, File 715-03, Box 252, Central Classified Files 1907-49, RG 79, NA II.

¹⁹ George M. Wright to The Director, February 19, 1932, File 720-04, Box 253, Central Classified Files 1907-49, RG 79, NA II.

²⁰ Quoted in Spence, *Dispossessing the Wilderness*, 10.

done in helping them by restoring the things that they know and like best?”²¹ Nothing came of this proposal, yet it is worth considering that Wright’s idea – like Catlin’s – anticipated two actual initiatives at the end of the twentieth century: the movement to restore agricultural land to an expansive “buffalo commons” on the Great Plains, and the establishment of the Intertribal Bison Cooperative dedicated to building up bison herds on Indian reservations. More to the point, perhaps, Wright’s idea also anticipated the Leopold Report’s visionary statement that every national park ought to serve as a “vignette of primitive America” – an idea that will be discussed in the next chapter.

The proposal to establish a bison herd ran headlong into Park Service efforts to expand the park on the east side so as to include more winter range. Albright went so far as to prepare a legislative proposal for the land transfer, asking Wright to comment on it before he submitted it to the congressional committee. But the legislation never stood a chance because the Blackfeet remained adamantly opposed to giving up any reservation land to the park. A Blackfeet elder named Mountain Chief commented after a meeting with Interior officials on the land issue, “We don’t want to part with it....They said they are going to put buffalo on the land [but]...I think it is just a bait.”²² In the end, the Park Service was discouraged from trying to work with the Tribe on co-managing a bison herd, although the idea would be revived from time to time.

The Wildlife Division’s fourth initiative was to get park officials to confront the issue of livestock grazing. For Wright, Dixon, and Thompson, the major problem with livestock grazing was that it allowed competition between domestic livestock and native ungulates for a limited food supply. When the biologists were in Glacier, they found that horses trespassed and grazed on the natural pasture around the lower end of St. Mary Lake. This was critical winter range for elk. Recognizing that patrolling the boundary was not a workable solution, the Wildlife Division recommended construction of a two-mile-long fence.²³ The park administration demurred, and horse grazing was allowed to continue on St. Mary Flats as well as numerous other locations.²⁴

The Wildlife Division had no further direct involvement in Glacier until 1936. By then, the division contained a cadre of biologists schooled in wildlife ecology including Adolph Murie, Lowell Sumner, and Victor H. Cahalane. Tragically, Wright himself died

²¹ George M. Wright to The Director, February 2, 1932, File 713-03, Box 252, Central Classified Files 1907-49, RG 79, NA II.

²² Quoted in Spence, *Dispossessing the Wilderness*, 96.

²³ H. C. Bryant to Superintendent, November 20, 1931, File 720-04, Box 253, Central Classified Files 1907-49, RG 79, NA II.

²⁴ Dave Shea, Susan Olin, and Jen Asebrook, “Glacier National Park Eastside Grasslands Ecology Project Final Report,” 2004, p. 3, George C. Ruhle Library, GNP.

in a car accident that year. The biologists were spread thinly, being dispatched to any given park as particular needs arose. In late October 1936, Superintendent Scoyen informed the director that his rangers had observed an outbreak of disease among bighorn sheep and he wanted a wildlife expert to assess the situation. The Wildlife Division scrambled to assign someone. At first it was to be Murie, but he was fully committed elsewhere. Associate wildlife technician Richard M. Bond made two preliminary field inspections in December 1936 and June 1937. Finally, the problem was assigned to Sumner, who visited the area in August 1938 and May 1939. Sumner's field study and investigative reports in 1938 and 1939, although cursory by later standards, constituted one of the first ecological wildlife studies made in Glacier.²⁵

Park officials viewed the decline of the bighorn sheep very seriously. The species was considered to be "dangerously near extinction in the United States" so the population in Glacier had national significance. In the game census for 1935, the park estimated the number of bighorn sheep in the park at 268. The following year, after many animals sickened and died, the estimate was 115. The Many Glacier band dropped from 69 to 17. A press release noted that "particular interest centers about the Many Glacier band of bighorn as they are readily seen each spring and fall from the highway near the Many Glacier Hotel."²⁶

As a result of the biological investigations, concern shifted from the outbreak of disease – which appeared to have run its course after the winter of 1935-36 – to the condition of the range. For the band of bighorn sheep in the Many Glacier area, competition from horse grazing had greatly diminished the available forage on their accustomed range. It was found that the concession's stock were pastured at various locations during the summer, including on the upper slopes of Apikuni Mountain, the bighorn sheep's lambing grounds. The Wildlife Division recommended an adjustment of

²⁵ E. T. Scoyen to Director, October 26, 1936, and Cahalane to Paul Brown (telegram), November 4, 1936, File 720-04, Box 69, Region II Central Classified Files 1936-52, RG 79, National Archives – Central Plains Region (hereafter NA-CPR); Victor H. Cahalane to Scoyen, February 17, 1937, and A. E. Demaray to Regional Officer, February 18, 1937, Folder 14, Box 251, and John F. Aiton, "Special Report: Talus Slopes in Horse Pasture North of Sherburne Lake with Special Reference to the Winter Range of Bighorn Sheep," September 8, 1937, Folder 6, Box 252, E. Lowell Sumner, Jr. "Special Report on Many Glacier Band of Bighorn Glacier National Park," October 27, 1938, and "Special Report on an Investigation of the Many Glacier Band of Bighorn During the Spring of 1939," July 14, 1939, Folder 1, Box 252, GNP Administrative Records, GNP Archives.

²⁶ R. R. Vincent, Memorandum for the Press for Immediate Release, March 4, 1940, Folder 1, Box 252, GNP Administrative Records 1910-1984, GNP Archives.

where the concession was permitted to pasture its horses as a preliminary step toward phasing out horse grazing altogether.²⁷

The Wildlife Division was hampered in its work by a shortage of funds for travel expenses as well as insufficient personnel. It lacked strong support from the NPS leadership and was finally dissolved in 1939 by way of an interagency agreement with the U.S. Fish and Wildlife Service. Some of the former NPS biologists, including Cahalane, Murie, and Sumner, continued to serve the national parks from their new postings in the Fish and Wildlife Service's, Division of Wildlife Research, Section on National Park Wildlife. This organization included three biologists based in Washington and six in the field. Of the six in the field, four were assigned to NPS regional offices and two were at large (based in Washington and San Francisco). Sumner's wildlife investigations at Glacier continued into the early 1940s, while Cahalane made surveys of the winter elk range in 1940 and 1947. These ongoing investigations notwithstanding, the influence of the wildlife biologists waned after the Wildlife Division was dissolved.²⁸



3.3 Elk and Winter Range

In the 1930s, depressed deer and elk populations began to rebound on many wildlife ranges throughout the West as a result of game conservation laws, predator control, and changes in habitat (such as forest clearing for agriculture). While

²⁷ E. Lowell Sumner, Jr. "Special Report on Many Glacier Band of Bighorn Glacier National Park," October 27, 1938, and "Special Report on an Investigation of the Many Glacier Band of Bighorn During the Spring of 1939," July 14, 1939, Folder 1, Box 252, GNP Administrative Records, GNP Archives.

²⁸ Starting in 1934 and continuing after the Wildlife Division was defunct, Glacier designated one ranger to be responsible for wildlife and forestry investigations. This position was first assigned to John Aiton, and it was through Aiton's initiative that wildlife experts were brought to the park to study the bighorn sheep. In 1943, Aiton transferred to another park and ranger A. D. Cannavina took his place, serving in that capacity through the 1950s. W. C. Henderson, "Memorandum on General Procedure of the Section on National Park Wildlife, Division of Wildlife Research, Bureau of Biological Survey, January 31, 1940, File 714, Box 67, and Victor H. Cahalane to Director, April 22, 1948, File 715, Box 67, and Superintendent to Regional Director, November 25, 1940, File 720-04, Box 69, Region II Central Classified Files 1936-52, RG 79, NA-CPR; Glacier National Park, *Annual Report, 1943*, typescript, p. 5, and Glacier National Park, *Annual Report, 1944*, typescript, p. 4., copies provided by GNP Archives.

conservationists and sportsmen initially applauded the resurgence of game animals, they gradually came to recognize that population increases of these species, if unchecked, could lead to overgrazing, rapid deterioration of range conditions, and ultimately a population crash when the herd faced starvation. Something of the sort occurred on the Kaibab Plateau near the Grand Canyon in the late 1920s, where the deer population irrupted and then crashed. Although biologists debated precisely what lessons were to be drawn from the Kaibab disaster, it nonetheless served as a warning to range managers everywhere.

In 1932, park rangers made the first count of elk in Glacier, enumerating 55 head on winter range on the east side of the park. Park managers began referring to three distinct elk ranges, one located around St. Mary Lake, another along the Middle Fork, and a third along the North Fork. Concerned that the elk herds might get too large for their respective ranges, rangers constructed exclosures at eleven locations in 1935 and began monitoring the distribution of plants inside and outside each exclosure to determine effects of foraging by various ungulates. In 1937, the park invited Dr. J. W. Severy, professor of botany at Montana State University, to make the first survey of range conditions. Severy's report revealed that elk range in the park was indeed overgrazed. He found that the range along the Middle Fork was the most overgrazed of any area in the park.²⁹

Sumner investigated the elk range adjacent to the Middle Fork in 1939. He suggested that an important factor contributing to rapid growth of the elk herd in this area was the abundance of forage in the aftermath of the big burn in 1910. Ironically, it was in this area that Yellowstone elk had been released in 1912. "The reintroduction of so many elk into this fire-swept territory appears to have been ill advised," Sumner wrote, noting that the now abundant elk had practically denuded some south-facing slopes and impeded re-establishment of the conifer forest. The problem was made worse by the fact that the elk's former winter range along the Middle Fork had been mostly taken up in small ranches.³⁰

Forest Service officials shared the park's concerns over elk numbers. The Forest Service established a division of wildlife management about the same time as the Park

²⁹ C. J. Martinka, "Wildlife Management in Glacier National Park, A Regional Perspective," June 1982, George C. Ruhle Library, GNP; Lowell Adams, "Special Report, Recommended Management Plan for the Cervidae in Glacier National Park," August 29, 1947, File 715, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

³⁰ E. Lowell Sumner, Jr., "Special Report on the Elk Forage Problem Adjacent to the Middle Fork of the Flathead River, Glacier National Park," July 8, 1939, File 720-04, Box 69, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

Service, but its wildlife experts came out of the agency's existing range management program, and the Forest Service's wildlife program in the early years focused heavily on big game habitat and carrying capacity studies. This was because the Forest Service, in contrast to the Park Service, shared the wildlife management function with the states: the states owned the wildlife while the Forest Service, as landowner, managed the habitat. When some wildlife ranges on national forests became "overstocked," the Forest Service reacted by insisting that it had the right to reduce game populations when necessary in order to protect the range. Western state governments bridled at the Forest Service's assertion of this prerogative as they believed it impinged on the states' right to regulate hunting. Sportsmen's organizations suspected the Forest Service of being overzealous to protect the range on behalf of livestock interests. Nonetheless, the Forest Service and state wildlife managers were able to forge a working relationship, and herd reductions were accomplished in many western states during the 1930s mainly through increases in the sportsmen's take. As time went on, the Forest Service, state wildlife managers, sportsmen's groups and livestock growers achieved a fair degree of consensus and cooperation in controlling the size of deer and elk herds. Besides the annual sportsmen's hunt, they developed another important strategy that, like sport hunting, had no place in the national parks. Forest managers commonly worked out a sort of "horse trade" with private landowners for the mutual benefit of wildlife and livestock. According to this arrangement, high-elevation pasturage on the national forests would be open to sheep and cattle grazing in the summer and fall, and low-lying private lands would be available for deer and elk foraging in the winter and spring. If ranchers could put their livestock on the national forests in summer and fall, then the low-lying pasturage or "short range" (much of it in private ownership) would support wildlife as well as livestock through the winter and spring.³¹ Big game management on the Lewis and Clark National Forest and the Flathead National Forest mirrored these developments occurring throughout the region.³²

Glacier's resource managers were certainly privy to the cooperative approaches developed by national forest managers, state wildlife managers, sportsmen's groups, and livestock growers, but they were also somewhat peripheral to the discussions since both hunting and grazing were prohibited in the national park. At first, park officials assumed that elk numbers inside the park could be controlled by means of hunting on the adjoining national forest lands. Since elk migrated out of the park each winter season, herd size could be managed by increasing the sportsmen's take when the herd was located on its

³¹ Catton and Mighetto, *The Fish and Wildlife Job on the National Forests: A Century of Game and Fish Conservation, Habitat Protection, and Ecosystem Management*, 85.

³² *Ibid.*, 61-63, 87-92.

winter range outside of the park. The first time that park officials sought that kind of cooperation was in 1944, when the Forest Service and state wildlife managers granted the park's request for an extended season of elk hunting in the area adjoining the park. However, an unusually mild winter that year defeated the purpose of the extended hunt as few elk left the park. Extended elk hunting seasons in the next two years did not accomplish meaningful herd reduction either, despite cooperation by local sportsmen.³³

In 1947, the Fish and Wildlife Service (the former Biological Survey) directed biologist Lowell Adams to investigate the problem and make recommendations for the Park Service. Adams found that elk, deer, and moose were overabundant on nearly all of the winter range in and adjoining Glacier. The ungulates were overgrazing and overbrowsing certain types of plants – in other words, the unnaturally large herds were causing impairment of natural conditions. Adams recommended that immediate steps be taken to reduce herd size. He urged that the only practical approach was for Park Service personnel to kill surplus animals in the park, a method known as “direct reduction.” Further, he suggested that winter range in the park be blocked into five wildlife management units (such as existed on other federal lands). He referred to these proposed divisions as the North Fork, Middle Fork, Lake McDonald, Belly River, and East Side units.³⁴

The Park Service balked at these recommendations, which threatened to undermine the conception of national parks as complete wildlife sanctuaries. Park Service officials were miffed when the Fish and Wildlife Service distributed Adams's report to the Forest Service and the Montana Fish and Game Commission without prior consultation. Desiring another biological opinion, the Park Service asked Victor Cahalane (who had returned to the NPS as chief biologist) to study range conditions in Glacier and make recommendations to management. Cahalane visited the park in mid October 1947 just before the end of the field season. During Cahalane's visit Superintendent J. W. Emmert held two lengthy meetings with the biologist and the ranger staff. Cahalane found broad agreement among the rangers that winter range was the most important wildlife problem in the park. In his February 1948 report on the investigation,

³³ Frank W. Childs, Regional Forester for NPS Region II, to Files, February 17, 1944, File 720-04, Box 69, and Lowell Adams, “Special Report, Recommended Management Plan for the Cervidae in Glacier National Park,” August 29, 1947, File 715, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

³⁴ Lowell Adams, “Special Report, Recommended Management Plan for the Cervidae in Glacier National Park,” August 29, 1947, File 715, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR. See also Superintendent to Regional Director, July 30, 1947, Folder 10, Box 245, GNP Administrative Records 1910-1984, GNP Archives. Also see James E. Cole, “Report on Belly River Elk Herd, Glacier National Park,” July 25, 1947, File 715-05, Box 68, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

he recommended against direct reduction of the elk herd in the Middle Fork area, although he thought it might be attempted on the east side. Cahalane's argument was that the steep terrain along the Middle Fork would make direct reduction exceedingly difficult and probably futile, whereas on the east side it could be done with relative ease. Cahalane did not dispute that overgrazing was having a deleterious effect on the natural vegetation in the Middle Fork area, but he noted that the animal and plant communities were not unique and were seldom visited by the public.³⁵

After Cahalane's visit, the park issued a press release informing the public about the wildlife problems and inviting public comment. A number of local residents responded. Two officials of the Bureau of Reclamation who were stationed in Hungry Horse approached Superintendent Emmert with a proposal that purportedly had the support of many local citizens. Their idea was to accomplish a direct reduction of the elk herd with the cooperation of local sportsmen's groups, have the elk meat sent to needy Europeans devastated by World War II, and publicize the program in such a way that it would bring more tourists to the Glacier area in future years. The superintendent thought the idea had a "great deal of merit." However, unable to persuade Regional Director Lawrence Merriam to concur with the plan, Emmert decided to continue with existing measures, which were based on killing elk only after they migrated outside the park.³⁶

Over the next five years, the elk population continued to grow and range conditions still worsened. Park staff worked with local sportsmen's groups, state wildlife officials, and the Forest Service to accomplish herd reduction but the hunts outside the park were ineffectual. In a move perhaps aimed at putting pressure on the Park Service to allow a hunt inside the park, the State of Montana terminated the extended hunting season in 1952. In light of the state's decision, Emmert called a meeting of several key staff to consider the problem again. The chief ranger, assistant chief ranger, and park naturalist, together with Yellowstone biologist Walter Kittams, who was on a detail to Glacier to study the range problem, agreed that direct reduction was necessary to protect "normal development" of native vegetation. Emmert sought "blanket authority" to reduce the elk population by up to 100 head per year.³⁷ Again his request was turned

³⁵ Newton B. Drury to Regional Director, May 5, 1948, and Victor H. Cahalane, "Wildlife Management, Glacier National Park - 1947," February 20, 1948, File 715, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

³⁶ J. W. Emmert to Regional Director, November 20, 1947, Folder 2, Box 258, and Lawrence Merriam to the Director, January 16, 1948, Folder 9, Box 245, GNP Administrative Records 1910-1984, GNP Archives; Superintendent to Regional Director, December 18, 1947, File 715-05, Box 68, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

³⁷ J. W. Emmert to Regional Director, July 18, 1952, File 715-05, Box 68, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

down by the regional director, Howard W. Baker, who said such a “slaughter program” could only be undertaken as a “last resort” when all reasonable alternatives had been exhausted. In a follow-up letter to Emmert, who felt deeply frustrated by this decision, Baker remarked that “slaughter of animals within a national park is a sensitive point which makes good ammunition for those who would open the park to public hunting.” Indeed, the regional director’s decision with regard to Glacier was strongly influenced by the situation in Yellowstone, where sportsmen’s groups were calling on the government to open that park to a public hunt in order to reduce the size of Yellowstone’s northern elk herd.³⁸ However, Baker agreed to allow further range surveys in Glacier by biologist Kittams in the following year. After another round of recommendations based on Kittams’ report in the spring of 1953, Baker finally approved a revised plan for direct reduction of the St. Mary elk herd, amending it slightly to encourage Emmert to work with the superintendent of the Blackfeet Indian Agency in formulating a plan for making elk carcasses available to the Blackfeet Tribe. Baker still withheld approval of similar plans for the Middle Fork and North Fork elk herds, insisting that the park must continue to rely on state-controlled hunting outside the park to reduce the size of those herds.³⁹

The park embarked on the direct reduction program in the winter of 1953-54. By then the herd was estimated to number about 950 head and the carrying capacity of the range was thought to be 350 head. During the next two years, efforts to haze elk out of the park were highly successful and the slaughter occurred on the Indian reservation under tribal auspices. Starting in the winter of 1955-56, the elk were no longer easily hazed out of the park and rangers did the killing on park land. Four of the rangers were tribal members appointed for this task. A total of 200 elk were killed within the park from 1955 to 1962, while considerably more were killed on the reservation. When the program was suspended in 1963, it was estimated that the St. Mary elk herd numbered about 200 head. Thus, it had achieved the desired results though at considerable cost in public relations.⁴⁰

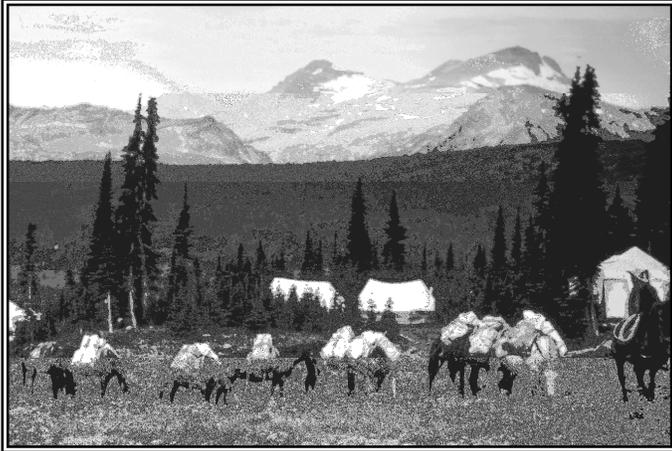
³⁸ Regional Director to Superintendent, July 31, 1952, File 715-05, Box 68, Region II Central Classified Files 1936-52, RG 79, NA-CPR; Superintendent to Regional Director, September 24, 1952, and Regional Director to Superintendent, October 17, 1952, File N1427, Box 2302, Administrative Files 1949-71, RG 79, NA II.

³⁹ Biologist to Regional Director, April 17, 1953, and Regional Director to Superintendent, November 15, 1953, File N1427, Box 2302, Administrative Files 1949-71, RG 79, NA II.

⁴⁰ “Summaries of Wildlife Conditions in Areas of the National Park System,” 1962, Folder 4, Box 258, GNP Administrative Records 1910-1984, GNP Archives; Superintendent to Regional Director, January 17, 1964, File N16, Box 24, Numerical Subject Files 1949-65, RG 79, National Archives – Rocky Mountain Region (hereafter NA-RMR).

The public relations angle was important, as Baker had alluded when he cited the public controversy surrounding the elk herd in Yellowstone, because by the late 1950s sportsmen's organizations had noted a wave of herd reduction programs sweeping the western national parks and they advocated opening these parks to public hunting as an alternative method of control. Some even suggested that direct herd reduction (hunting by rangers) violated the law against hunting in national parks; therefore, Congress must amend the law so as to provide for public hunting instead. In March 1960, W. J. Everin, director of the Montana Department of Fish and Game, notified Conrad L. Wirth, director of the NPS that he supported a motion of the Montana Fish and Game Commission "to replace the slaughter of elk and/or other game animals" in Glacier and Yellowstone "with high recreational hunting." The agitation coming from sport hunters in Montana was echoed across the region. This led to a sharp reappraisal of wildlife management policy within the Park Service. Regional Director Baker and the superintendents of both Yellowstone and Glacier strongly defended the existing policy of direct reduction. "I believe we *can* live with a program that involves killing of surplus animals in the Park," Superintendent Ed Hummel declared in January 1961. But in the following month, Wirth bowed to political pressure and issued a statement indicating that the Park Service was open to a revision of the no-hunting policy in those parks where ungulate populations had to be trimmed. Conservation groups, led by the National Parks and Conservation Association (NPCA) attacked Wirth's statement, saying it was destructive of a fundamental principle of national park management. As the controversy grew, Yellowstone Superintendent Lemuel L. Garrison entered the fray. Faced with dissention by this key official, Wirth retracted his statement in September 1961. Both sides in the public hunting controversy were left bruised and dissatisfied. This set the stage for Secretary of the Interior Stewart Udall's appointment of an advisory committee on wildlife management in the national parks, better known as the Leopold Committee. The Leopold Report of 1963 cleared the air (it upheld the Park Service's prerogative to control wildlife numbers through direct reduction) but it went much farther, providing a new basis for all natural resource management, not just management of deer and elk.⁴¹

⁴¹ W. J. Everin to Conrad L. Wirth, March 23, 1960, and Wirth to Everin, April 25, 1960, Folder 3, and Edward A. Hummel to Conrad L. Wirth, January 5, 1961, Folder 4, Box 258, GNP Administrative Records 1910-1984, GNP Archives; Sellars, *Preserving Nature in the National Parks*, 195-201.



3.4 Grazing and Horse Use

Under Mather and Albright, the Park Service strongly opposed use of the parks for livestock pasturage except in those instances where the livestock were integral to tourist accommodations. The Park Service's first concession contract with the Glacier Park Hotel Company in 1917 allowed the company to pasture cows, sheep, horses, and mules for the supply and accommodation of its guests and employees. The numbers of cows and sheep must have been small, but the numbers of horses and mules were significant. The tolerance for horse grazing was due to the fact that horses were integral to park operations – both for ranger patrol and visitor use. Horses were also thought to contribute to the rustic ambiance found in many national parks in the West. But their effect on native plants was not negligible, an inconvenient fact that the wildlife biologists first brought to light during the wildlife survey in the early 1930s. By the late 1930s the Park Service had begun to re-assess its policy on horse grazing and in the World War II era it promulgated new grazing regulations that looked to phasing out this type of resource use.

At Glacier, rangers noted the likely connection between horse grazing and bighorn sheep decline in the mid 1930s. Early efforts to curtail horse grazing focused on the Many Glacier area, where the horse concession stationed approximately one third of its saddle stock during the summer. Ranger Jack Aiton took a comprehensive view of the situation, however, and prepared a series of reports on the effect of horse grazing at various locations in the park. His efforts led to a park-wide assessment by biologist Lowell Sumner in 1941. Sumner recommended that horse grazing should be eliminated around the chalets, hotels, and other major staging areas, including Two Medicine, Cut Bank, East Glacier, Bowman Lake, Kintla Lake, and the lower end of Lake McDonald. In all such areas, horses should be fed hay and grain. The onus should be on the operator to purchase and transport horse feed to these locations. Additionally, Sumner wanted to

end use of the Red Eagle Lake area and the south side of St. Mary Lake for horse pasturage.⁴²

As a first step toward implementation of Sumner's recommendations, the Park Service began to require annual reports on the total volume and distribution of horse grazing in Glacier. According to the report prepared by Superintendent D. S. Libbey for 1941, the Park Saddle Horse Company utilized park grazing resources for a total of 4728 horse-days. More than one third of the use was in the Many Glacier area. Other high use areas included the Goat Haunt and Two Medicine areas. It is possible that the amount of horse grazing was actually much greater than this, as the superintendent noted that G. W. Noffsinger, president of the Park Saddle Horse Company, had stated the amount of grazing as 8886 horse-days in a conference with Sumner in June 1941. Meanwhile, government pack stock were grazed at four locations in the park: Logging Creek Ranger Station, Nyack Ranger Station, Cut Bank Ranger Station, and Belly River Ranger Station, for a total of 2022 horse-days. More than half of the total was at the last named location.⁴³

During World War II, the Park Service decided to close down concession operations in Glacier for the remainder of the war. The Park Saddle Horse Company promptly went out of business. In its heyday the company had owned 1,000 horses and served 10,000 visitors each summer, but its business had steadily waned since the opening of the Going-to-the-Sun Road and by 1940 its volume of business had dropped by half. Noffsinger did not want to hold onto the pack stock through the war years. After World War II, two men by the names of Lewis and Evans acquired the horse concession but the operation was much reduced in size. Altogether they owned 135 horses and grazed them in the park for a total of 270 horse-days in 1946. The usage grew to 397 horse-days in 1949 and 517 horse-days in 1951. Still, it remained a fraction of what it had been before the war.⁴⁴

Evidently Noffsinger was able to sell some of his pack stock to the Park Service, for the number of government-owned pack stock reached an all-time high during World

⁴² E. Lowell Sumner, Jr. to Regional Director, June 1, 1939, File 718, Box 68, and Acting Regional Director to Superintendent, March 27, 1941, File 901-01, Box 76, and Sumner, "Special Report on Range Management and Wildlife Protection in Glacier National Park," October 18, 1941, File 715-06, Box 68, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁴³ Superintendent to Regional Director, December 18, 1941, and Superintendent to G. W. Noffsinger, January 3, 1942, Folder 10, Box 245, GNP Administrative Records, GNP Archives.

⁴⁴ Glacier National Park, "Grazing of Pack and Saddle Stock," reports for calendar years 1946, 1949, 1951, File 901-01, Box 76, Region II Central Classified Files 1936-52, RG 79, NA-CPR. For a brief history of the Park Saddle Horse Company, see "Guide to the Park Saddle Horse Company Records, 1915-1947," at <http://nwda-db.wsulibs.wsu.edu> <January 6, 2010>.

War II. In his report on grazing for 1943, Superintendent Libbey gave the number of stock as 40 and the amount of grazing as 4,791 horse-days. Most of the stock was grazed at three locations: park headquarters, St. Mary, and Nyack Ranger Station. Other locations were listed as Belly River, Polebridge, Logging Lake, Cut Bank, Two Medicine, and Many Glacier. At each location the horses were confined to small fenced pastures and their grazing was supplemented by hay and grain feeding.⁴⁵

The Park Service delayed action on phasing out horse grazing use through the war years because it did not want to provoke livestock interests, some of whom actually called for opening the national parks to grazing use as a wartime measure to increase food production. In 1944, freshman Congressman Clair Engle (D-CA) introduced a bill to allow grazing in the national parks. As part of the Park Service's response to the legislation, Chief Ranger B. R. Finch prepared a detailed memorandum on Glacier's limited grazing resources. While the main thrust of this report was to point out the marginal economic benefit that would derive from opening the park to grazing use, it also served to highlight existing problems associated with horse grazing. Additionally, it documented several locations in the park where cattle grazing trespass was prevalent. Regional Director Lawrence Merriam commented to Superintendent Libbey, "This is probably not the time to press law enforcement cases connected with grazing trespass, but we should be on the alert to improve our position in this regard as soon as the world food situation takes a turn for the better."⁴⁶

The critical step in phasing out horse grazing in the park came in 1946 when Superintendent Emmert announced the park's new grazing policy. All horses in the park – including horses belonging to the government, the concession, and private individuals, were to be hay and grain fed in all areas of the park except the Belly River and Cut Bank Creek drainages. Horse grazing would be allowed in the Belly River area from the foot of Elizabeth Lake to the head of Cosley Lake, and it would be allowed in the Cut Bank area from the Cut Bank Chalets down to the eastern boundary of the park. But if the range in those areas began to show signs of overgrazing, then hay and grain feeding would be instituted in those areas, too.⁴⁷

⁴⁵ Superintendent to Director, December 21, 1943, File 901-01, Box 76, Region II Central Classified Files 1936-52, RG 79, NA-CPR. According to a summary of pack and saddle stock grazing in the national park system in 1945 (same file), Glacier ranked fifth in a list of 22 areas. Topping the list were Yosemite, Sequoia-Kings Canyon, Hawaii Volcanoes, and Yellowstone.

⁴⁶ Chief Ranger to Superintendent, October 28, 1944, and Regional Director to Superintendent, December 5, 1944, File 901-01, Box 76, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁴⁷ "Grazing Policy, Glacier National Park," June 13, 1946, File 718, Box 68, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

Some people thought the grazing regulation ought to have an exemption for private horse users. Dr. G. B. Wright, a Kalispell physician, complained that most horse owners were not in a position to furnish their own hay and that the grazing regulation virtually forced them to patronize the horse concession if they wanted to get into the backcountry on horseback. In reply, Emmert said that the requirement to feed hay was not as onerous as it seemed, that it had become necessary in order to protect plant life, and that he could do nothing to ease or waive the regulation.⁴⁸

In 1952, Emmert did loosen the grazing policy for Glacier. Horses were permitted to graze in high meadow areas as long as they were kept more than 2,000 feet from any major developed area. Major developed areas included all roads, campgrounds, hotels, stores, chalets, and water systems. This change in the regulations seemed advisable in light of decreased numbers of horses in the park, and it was made specifically at the request of representatives of the Great Northern Railway Company. The same policy was reaffirmed in 1957.⁴⁹

Some grazing use practices that were completely non-controversial in the middle decades of the twentieth century would be seen as woefully misguided by a later generation of resource managers. In the 1930s, Noffsinger casually informed park officials by letter that his company planted timothy (a non-native grass) at certain locations in the park to augment the available natural forage. Places where this practice occurred were Goat Haunt, Many Glacier, and probably Belly River. The park administration used the Red Eagle meadows as winter pasture for its own pack stock as late as the mid 1960s. The park administration sometimes placed salt blocks in the vicinity of the old St. Mary Ranger Station, and it grew hay on St. Mary Flats, Two Dog Flats, and Red Eagle meadows. The park administration also transported hay to backcountry areas such as Belly River, and it is likely that this imported hay contained exotic plant seed that contributed to invasive plant infestations which were not recognized as a serious threat to natural conditions until many years later.⁵⁰

⁴⁸ G. B. Wright to J. W. Emmert, July 12, 1946, and Emmert to Wright, July 19, 1946, File 718, Box 68, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁴⁹ "Grazing Policy, Glacier National Park," March 3, 1952, Acting Regional Director to Regional Director, February 19, 1952, Frank W. Childs to James V. Lloyd, March 3, 1952, and J. W. Emmert to Edwin C. Matthias, March 3, 1952, File 901-01, Box 76, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁵⁰ Shea, D., S. Olin, and J. Asebrook, "Glacier National Park Eastside Grasslands Ecology Project Final Report," unpublished draft report, 2004, Glacier National Park, West Glacier, Montana. Planting of timothy by the company is mentioned in D. S. Libbey to G. W. Noffsinger, June 19, 1939, and Noffsinger to Libbey, July 2, 1939, Folder 7, Box 77, GNP Administrative Records 1910-1984, GNPA.



3.5 Fisheries

The park administration continued to manage aquatic resources primarily for recreational fishing during this era. As in former years, it relied on expertise provided by a sister agency (the U.S. Bureau of Fisheries through the 1930s, the Fish and Wildlife Service after 1939). In the year after the Fish and Wildlife Service was created, the Glacier National Park Fish Hatchery opened at Creston. By statute, this property was part of Glacier National Park and all fish reared by the hatchery were to be planted by park personnel in park waters; however, the facility was managed by the Fish and Wildlife Service. Four years later, the hatchery was transferred to the Fish and Wildlife Service and renamed the Creston National Fish Hatchery, and the facility was given latitude to put hatchery fish in other waters when Glacier's needs had been met.⁵¹ Most of the attention given to Glacier's fisheries in these years focused on how to obtain optimum results from planting hatchery fish. Despite continuous stocking, Glacier's streams never produced the excellent fishing that many people expected of them, and even its large lakes seemed less productive than they ought to be. Sporadic fisheries investigations focused mainly on trying to understand why.

The first fisheries investigations were made by a team under the direction of Albert S. Hazzard, aquatic biologist with the U.S. Bureau of Fisheries, in 1932 and 1933.⁵² Hazzard produced a report with management recommendations, including fishing regulations and a stocking plan. He found that most of the park's waters were best suited for native cutthroat trout. He argued that the introduction of exotic eastern brook trout into the Swiftcurrent and Two Medicine drainages was a good thing, and that

⁵¹ C. Robert Wasem, "A Brief History of Fish Management in Glacier National Park," June 1964, typescript, George C. Ruhle Library, GNP.

⁵² A. S. Hazzard to C. Gordon Fredine, June 8, 1960, File N1423, Box N-11, Region II General Files 1952-64, RG 79, NA-CPR.

this species now furnished a majority of the angler's catch in those waters. He approved of past efforts to stock lakes and streams that were barren of fish because of downstream barriers to fish migration, and he suggested that those efforts might be continued and expanded to other barren waters as demand for recreational fishing increased. Hazzard's team gave particular attention to spawning grounds with an eye to assessing the potential for natural reproduction in park waters. Hazzard was optimistic that fish populations would hold their own in the upper drainages but he doubted that natural reproduction would be sufficient to meet recreational demand in the park's lower, more accessible waters. Therefore, continued planting was in order in those areas. Hazzard noted the importance of maintaining some park waters in a pristine condition, but he thought that a few remote lakes and streams located off the trail system would suffice for that purpose. He was not opposed to stocking more backcountry lakes and streams with fish in order to provide for growing public use, even in those cases where the waters contained no fish.⁵³

Based on Hazzard's report, Superintendent Scoyen developed new fishing regulations in 1936. These included a closed season from November 1 to June 1 of the following year, an extended closed season for certain park waters, a limit of ten fish per person per day, a smaller creel limit for certain park waters, and prohibition of live bait.⁵⁴

That same year, Director Arno B. Cammerer issued Order No. 323 on fish policy. The policy aimed to redress the agency's traditional emphasis on recreational fishing in favor of a more ecological perspective by giving more weight to protection of native species. The first two items in the order were key: "No introductions of exotic species of fish shall be made in national park or monument waters now containing only native species" and "In waters where native and exotic species now exist, the native species shall be definitely encouraged."⁵⁵ But the practical effect of this order was limited by the fact that fish cultural activities were allowed to continue where fish populations already had been introduced. As a result, resource managers remained focused on providing good fishing for the park visitor even as they paid lip service to the ideal of keeping park waters ecologically pristine. David H. Madsen, the Park Service's top aquatic biologist in the 1930s, who transferred to the Fish and Wildlife Service in 1940, encapsulated this two-faced policy framework in a report on the Glacier National Park Fish Hatchery in 1941. "We should keep in mind, as a primary objective, the preservation of native

⁵³ A. S. Hazzard, "Management Recommendations for Waters of Glacier Park," 1935, File 714, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁵⁴ Glacier National Park, "Local Subsidiary Regulations," Folder 7, Box 262, GNP Administrative Records 1910-1984, GNP Archives.

⁵⁵ Arno B. Cammerer, "Office Order No. 323 Fish Policy," in Dilsaver, ed., *America's National Park System: The Critical Documents*, 149-50.

species and should avoid competition from exotic species by refusing definitely, from this time on, a wider distribution of exotics in Park waters,” he averred. Then he continued, “As a secondary objective, we should provide for the planting of fish of the proper size and age which based upon the best information we have will produce the best result in each individual water of the Park.” It was this secondary objective that claimed managers’ attention. Indeed, later in his report Madsen, noting that certain exotic species were already well established in some park waters, blithely remarked, “There seems to be no reason why we should not continue the planting of these species” – even though planting more exotics could hardly be squared with encouraging native species.⁵⁶

The park administration followed Hazzard’s 1935 stocking plan each year through 1945. Toward the end of the period, in 1943, the Park Service augmented the regular plants of fingerlings in Glacier with plants of 14,190 six-inch blackspotted cutthroat trout (*Salmo Clarki*). The practice of planting legal-size fish that could be caught as soon as they were put in the water was part of an initiative throughout the national park system to provide better fishing for park visitors. Not everyone thought this was a good idea. In an article published in *Outdoor America*, Hazzard blistered the Park Service for planting what he considered tame fish, arguing that it cheapened the angler’s experience “by making it possible for any dub to catch his limit.”⁵⁷ Park Service officials were sensitive to his criticism, but they pointed out that without supplemental planting many park waters would be practically fished out. Park managers were in a dilemma because many park waters simply lacked the necessary level of natural productivity to sustain the growing level of demand. When visitors complained that fishing was poor, it led some people in the Park Service to question why fishing in the national parks was permitted at all.⁵⁸ Glacier’s staff was increasingly skeptical toward the effort. In 1945, Superintendent Emmert stated unequivocally, “No one in this park favors planting legal size trout at any time.”⁵⁹

A decade after Hazzard’s first investigation of park waters, Ancil D. Holloway, biologist with the Fish and Wildlife Service, conducted the second investigation of Glacier’s fisheries. Like Hazzard, he focused on evaluating the natural productivity of

⁵⁶ David H. Madsen, “Report of Inspection Glacier National Park Fish Hatchery, Creston, Montana, September 11th to 18th, 1940,” January 9, 1941, File 714, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁵⁷ Albert S. Hazzard, “Wild Trout Fishing Endangered in National Parks,” *Outdoor America* (September-October 1944), reprint, n.p.

⁵⁸ C. P. Russell to Newton B. Drury, October 30, 1944, and H. W. Bryant to Regional Director, November 7, 1944, File 714, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁵⁹ Superintendent to Regional Director, February 12, 1945, File 714, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

different lakes and streams so that hatchery fish could be put to optimum use. Also like Hazzard, he recommended an aggressive schedule of planting fingerlings. But Holloway went further, recommending that certain waters such as Cut Bank Creek should be stocked with legal-size trout, and that Lake McDonald should be stocked with exotic eastern brook trout. He justified the latter recommendation on the basis that the exotic species had already been introduced in the early twentieth century. The park's research committee (comprising the chief ranger, the assistant chief ranger, and the park naturalist) objected to both these features of Holloway's plan. With regard to planting legal-size fish in Cut Bank Creek, the research committee believed it was folly to plant more fish than the stream could sustain through the winter simply on the supposition that they would be removed by anglers anyway. With regard to putting eastern brook trout in Lake McDonald, the committee held that this action would violate policy because the exotic species was not established there, despite earlier plantings. The regional office overruled the park on the first point, but it conceded the second point. With that one exception, Holloway's 1945 report replaced Hazzard's 1935 report as the new basis for the park's fisheries management program.⁶⁰

The disagreements over how to manage Glacier's fisheries underscored the need for an aquatic biologist on the park staff. It was a request that Glacier superintendents had been repeating for years. Director Newton B. Drury acknowledged the need in April 1948, but finally had to concede there was no money for one. Instead, he procured another fisheries investigation by a biologist with the Fish and Wildlife Service, Glacier's third such investigation in a decade and a half. Biologist Lewis R. Garlick spent three weeks studying various park waters, mostly on the west side of the divide. Again, the primary focus was to understand why park waters did not produce more fish. Garlick believed the limiting factor was a lack of good spawning streams tributary to the lakes. Again, the findings were used to justify more vigorous stocking of lakes.⁶¹

On Garlick's recommendation, the level of stocking in Glacier was increased ten-fold, from approximately 150,000 fingerlings to 1.5 million fingerlings per year. Most of the increase was placed in Lake McDonald, Kintla Lake, and Bowman Lake. Consistent with Holloway's earlier recommendations, smaller quantities were planted in Cut Bank, Dutch, and Camas creeks, as well as Mud, Upper Two Medicine, Fishercap, Red Rock, Bullhead, St. Mary, Cosley, and Glens lakes. Garlick also recommended annual

⁶⁰ Superintendent to Regional Director, February 12, 1945, File 714, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁶¹ Wasem, "A Brief History of Fish Management in Glacier National Park;" Lewis R. Garlick, "Report of Fishery Management Investigations at Glacier National Park with Recommendations for Planting Programs in Several Lakes," File 714, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

plantings of 10,000 five-inch fingerlings (two inches shy of legal-size fish) in the heavily fished Josephine Lake at Many Glacier.⁶²

The notion that aggressive stocking could yield “good fishing” reached a pinnacle in 1951 when the Park Service considered stocking upper McDonald Creek. Fishing in this stream had once been considered excellent, but since the construction of the Going-to-the-Sun Road the quality of fishing had diminished. Fisheries experts had long recognized connections between road construction, sedimentation, and stream habitat. Still, the effects of roads on fish habitat had only begun to receive scientific study (primarily by the Forest Service). In the case of upper McDonald Creek, the stream had a good mix of rapids and deep holes, the stream bottom was alternately solid rock and gravel, and it had every other appearance of good fish habitat. Superintendent Emmert suggested there was no apparent reason why the stream could not be “managed so that it will support fish.”⁶³ The Fish and Wildlife Service proposed to make an experimental planting of 10,000 two-year-old cutthroat; each fish’s adipose fin would be clipped and their movements would be tracked through a creel census so that biologists could assess why fish no longer preferred those waters. The regional office forwarded the proposal to the director’s office, where Assistant Director Ronald F. Lee finally pointed out that the stocking program was going too far. To Lee, it appeared obvious that the lack of fish in McDonald Creek resulted from the presence of the road and nothing could be done to bring back that section of creek’s natural conditions as fish habitat. To provide “good fishing” under the circumstances, Lee remarked, “it would be necessary to restock catchable fish practically every week during the summer months.”⁶⁴ So Emmert withdrew the request. (Today upper McDonald Creek still has few fish. Since sediment from the roadbed is present in the lakebed, resource managers now assume that the stream did carry an additional sediment load for a period of years as a result of the road construction, but the increase in sedimentation has largely abated. There are probably additional habitat factors that have prevented a resident fish population from taking hold since that time.)⁶⁵

⁶² Wasem, “A Brief History of Fish Management in Glacier National Park;” Lewis R. Garlick, “Recommended Changes in Present Stocking Plans for Glacier National Park,” no date, File 714, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR; Superintendent to Regional Director, March 25, 1953, File N1423, Box 2303, Administrative Files 1949-71, RG 79, NA II.

⁶³ Superintendent to Regional Director, May 16, 1951, File 714, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁶⁴ Assistant Director to Regional Director, June 21, 1951, File 714, Box 67, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁶⁵ Jack Potter email to author, November 7, 2010.

The heavy stocking program recommended by Garlick continued for three years and then was sharply curtailed. Officials finally decided that heavy stocking was both futile and misguided. Beginning in 1953, the volume of fish planting fell to less than 100,000 fingerlings per year with the exception of large plantings in 1959 and 1962. Mostly blackspotted cutthroat were planted on the west side and eastern brook trout were planted on the east side. The heavy stocking from 1950 to 1952 also included some rainbow trout and mackinaw, while the large quantity in 1962 included 160,000 grayling obtained from the State of Montana and placed in Elizabeth Lake. Stocking of the exotic eastern brook trout ceased after 1957.⁶⁶

The rollback in fish planting did not go unnoticed. Angry letters appeared in local newspapers. One summer resident at Lake McDonald organized a letter-writing campaign to Montana's congressional delegation. But in choosing to wind down the stocking program, the Park Service had the support of the Fish and Wildlife Service, state officials, and even local sportsmen's groups.⁶⁷

The controversy did lend support to the park's longstanding request for an aquatic biologist. In the fall of 1962, a full-time position of fish and wildlife management ranger was established and C. Robert Wasem joined the park staff in that function. Wasem began a new phase of fisheries investigations. This time, the studies were aimed at reassessing the capacity of various park waters to support planted fish in light of their relatively low biological productivity. In 1963, the park officially replaced the former stocking program with an interim fishery management plan. The plan stated that native species only would be introduced in waters west of the Continental Divide, and that no more eastern brook trout would be introduced in waters east of the divide. Rainbow trout and grayling might be stocked in eastside waters until such time as hatchery-reared native cutthroat became available.⁶⁸

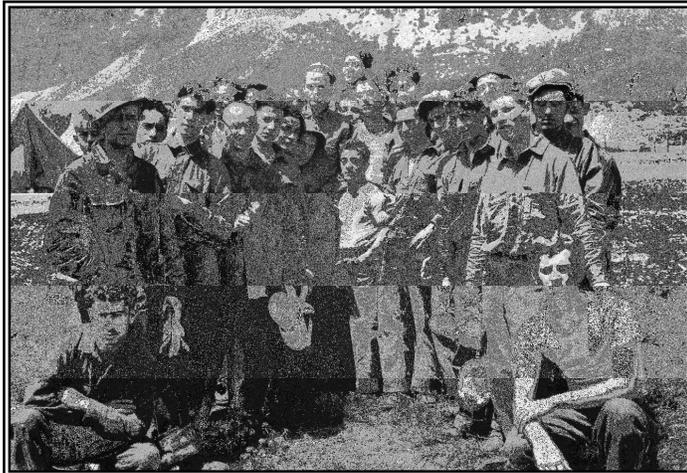
Even as the park turned its attention to aquatic habitat research and the condition of native fish populations, it still responded to anglers' expectations that the park provide good recreational fishing. The fish stocking program limped along for another seven years. The interim fishery management plan was replaced by a long range aquatic resources management plan in 1968, in which Wasem outlined a new stocking program

⁶⁶ Wasem, "A Brief History of Fish Management in Glacier National Park."

⁶⁷ Superintendent to Regional Director, October 17, 1961, Folder 3, Box 239, GNP Administrative Records 1910-1984, GNP Archives. Also see letters in File 1423, Box 2303, Administrative Files 1949-71, RG 79, NA II.

⁶⁸ Wasem, "A Brief History of Fish Management in Glacier National Park;" Acting Regional Director to Director, January 19, 1962, enclosing Glacier National Park, "Fisheries Management – Glacier National Park," File N1423, Box N-2, Region II General Files 1952-64, RG 79, NA-CPR.

among other things.⁶⁹ Wasem's ten-year stocking schedule limited stocking to five heavily fished lakes: McDonald, Bowman and Kintla lakes on the west side, and Lost and Two Medicine lakes on the east side. Native west-slope cutthroat trout would be planted on the west side, and rainbow trout would be planted on the east side. Altogether the stocking program amounted to approximately a quarter million fish per year.⁷⁰ Despite this concession to recreational fishing, however, the Park Service's attitude at this stage was best summed up in a letter from Regional Director Lemuel L. Garrison to the director. "Are we to continue an annual stocking program in an attempt to satisfy the hunger of the fisherman, which incidentally, is a public relations Frankenstein of our own design? Or are we to restore the lakes and streams to their natural state? In view of the Leopold Report we believe the latter should be our goal."⁷¹ The park finally discontinued all fish stocking in 1970.⁷²



3.6 Forest Fire Protection

Glacier National Park built up a very robust fire organization in the 1930s. Fire detection was improved with additional lookout posts. Fire prediction was enhanced with the development of vegetation type mapping. Fire suppression was strengthened with improvements in the trail system and the communications system, enabling fire crews to hit fires early. The biggest factor in the improved fire organization was the CCC, which provided a large pool of firefighters. By sheer force of manpower, the Park Service was

⁶⁹ C. Robert Wasem, "Long Range Aquatic Resources Management Plan, Glacier National Park 1967-1976," February 1968, George C. Ruhle Library, GNP.

⁷⁰ Park Ranger to Superintendent, April 21, 1967, Folder 2, Box 240, GNP Administrative Records 1910-1984, GNP Archives.

⁷¹ Regional Director to Director, September 21, 1964, Folder 5, Box 239, GNP Administrative Records 1910-1984, GNP Archives.

⁷² William J. Briggie to John D. Findlay, August 12, 1970, Folder 5, Box 240, GNP Administrative Records 1910-1984, GNP Archives; "Fish Stocking Doesn't Increase Cutthroat," *Hungry Horse News*, August 14, 1970.

able to accomplish the goal that had eluded it in the previous decade, a near total suppression of all forest fires. In 1936, the Heavens Peak Fire escaped and burned about 8000 acres, the only big burn in the decade. In 1940, the park experienced its most strenuous fire season in years as numerous lightning storms swept through the area. The forest fire record that year was telling of how effective the organization had become: despite 47 reported fires (37 caused by lightning), the fires burned just 918 acres.⁷³

The fire organization featured four tiers of personnel, each tier distinguished by a different level of training, experience, and attention to the fire protection mission so that the number of men committed to fire suppression at any given time could vary widely. The first tier consisted of the permanent ranger force, which numbered around 20 men. Park rangers attended annual fire training school and served as fire crew leaders when fires broke out. The second tier was made up of a seasonal force of fire guards, lookouts, and dispatchers, numbering about 30 men. Though less highly trained than the rangers, these individuals dedicated most or all of their working hours to fire protection. The third and fourth tiers came from the CCC. In its first line of support, each CCC camp designated at least three experienced men as firefighting foremen and each of these foremen was in charge of a “flying squad” of 15 CCC enrollees. In back of the flying squads, another 25-man crew from each camp was held in reserve. All the CCC enrollees who were involved in either the first or second line of support received training in putting out fires.⁷⁴ Altogether there were eight camps at the start of the CCC era with a resident population of over one thousand young men. The total fire organization in Glacier represented a force of some 50 park employees plus 250 CCC enrollees.

Fire guards and CCC crews worked on maintaining and extending about 200 miles of telephone lines. The telephone lines connected isolated ranger stations and lookouts to headquarters. As soon as progress on the Going-to-the-Sun Road allowed it, CCC crews completed the Herculean task of lugging massive lengths of telephone cable up and over the Continental Divide, establishing telephone communications between the east and west sides of the park. By the middle of the decade all CCC camps were brought into the network of telephone lines as well. Two-way radio sets gained use during the decade. Fire guards and CCC crews also maintained and improved trails. The park’s trail system was the primary means of getting to remote fires. Movement of men and equipment over the trails was by foot or horse; the terrain was too rugged to permit use of trucks as occurred in many other national parks in the CCC era. The Park Service

⁷³ Glacier National Park, *Annual Report, 1940*, typescript, p. 4, copy provided by GNP Archives. For a brief description of the Heavens Peak Fire, see Rothman, *Blazing Heritage*, 63.

⁷⁴ Glacier National Park, *Annual Report, 1934*, typescript, n.p., copy provided by GNP Archives.

tried to get Glacier's horse concession involved in the fire organization but the horse concession refused. So the park hired two packers and acquired two pack trains of ten horses each for hauling tools and equipment to backcountry fires. Such a large reliance on horse transportation was an unusual feature of Glacier's fire organization.⁷⁵

In 1937, the CCC completed a vegetation type map for the entire park. Aimed at assisting with fire control efforts, it was a step forward in the fire organization's ability to predict fire behavior. It also provided information to the interpretive program, particularly on the relative abundance of tree species. The vegetation type map classified all forested areas according to the dominant tree species found in each area. It found that the seven most common forest types were lodgepole pine, sub-alpine fir, Douglas fir, Englemann spruce, western larch, limber pine, and whitebark pine, and these forest types were present according to a ratio of 23:18:8:8:4:2:1. In other words, forest cover in which lodgepole pine was the dominant species was 23 times more common than forest cover in which whitebark pine was the dominant species. The vegetation type map also recorded the presence or absence of tree species, regardless of whether they were the dominant tree. In this view, sub-alpine fir were found over the widest area, followed by western larch, Engelmann spruce, lodgepole pine, limber pine, whitebark pine, and aspen. The area covered by these seven species varied according to a ratio of 10:9:7:5:4:2:1.⁷⁶

CCC crews also performed "forest cleanup," removing dead or down timber that park managers deemed to be unsightly and a fire risk. Most of this work was conducted around Belton and Lake McDonald in areas that had been swept by fire in 1926 and 1929. As with fire suppression, the presence of the CCC allowed the park administration to accomplish labor-intensive tasks that had been beyond the Park Service's grasp in the previous decade. Some argued that the removal of fire-killed trees was unnatural and that decaying snags were a vital part of the forest ecology. But the Park Service defended its policy on the grounds that the scale of the 1926 and 1929 fires was not natural and therefore the big burns did not present a natural appearance. It was believed that the whole nature of the forest had changed during the preceding half century. As a result of an increase in human-caused fires, more snags and down timber existed than formerly. Long-time local residents frequently commented to park managers that the forests had once been more open, containing many fewer dead trees. "That park forests were not unnaturally untidy is the contention of everyone who knew the park area of the old days,"

⁷⁵ "Fire Protection Organization Annual Report – Oct. 1, 1931 to Sept. 30, 1932," File 207-01, Box 238, Central Classified Files 1907-49, RG 79, NA II.

⁷⁶ Glacier National Park, *Annual Report, 1935*, typescript, p.6, and *Annual Report, 1937*, typescript, p. 4, copies provided by GNP Archives; Harold E. Bailey, "The Abundance of Park Trees," *Glacial Drift* 11, (1938), 7-8.

wrote park historian George C. Ruhle. “Unfortunately untidy forests means high fire hazards.”⁷⁷ Thus, forest cleanup was linked to forest protection, and efforts to improve forest aesthetics purportedly coincided with efforts to restore natural conditions.

Historian Hal K. Rothman, in his history of fire management in the national parks, observed that the CCC gave the Park Service the labor pool it needed to accomplish fire suppression, and that the remarkable feat of nearly total fire suppression reinforced the Park Service’s sense of control over nature. “This vision, of an orderly intact nature managed by humans, reflected the stance of the foresters in the National Park Service,” Rothman wrote. Further, the foresters’ vision of fire prevention dovetailed with the vision of forest beauty promoted by the service’s landscape architects. “This neatly manicured version of nature contrasted with the messier ideal held by wildlife biologists and other scientists,” Rothman noted.⁷⁸ Of course, wildlife biologists stood ready to join foresters and landscape architects in the control of nature whenever the results promised to bring wildlife conditions closer to what they had been in the past. It was just that the kinds of manipulations that foresters and landscape architects proposed were more often harmful than helpful for wildlife management.

With the coming of World War II and the dismantling of the CCC, the Park Service had to rethink its approach to fire prevention. Rothman has described the postwar years as a period of divergence, when some national parks found new means – especially use of aerial surveillance – to carry on a traditional program of all-out fire suppression, while other national parks began to experiment with natural prescribed fire. In general, western parks held to the Forest Service model of treating forest fire as an enemy of good forest management, while eastern national parks (notably Everglades) began to challenge that model. Glacier was among a handful of western parks that took the lead in use of smokejumpers and other innovative firefighting techniques even as it continued down the traditional path of fire prevention.⁷⁹

Glacier’s adjustment to the end of the CCC era began with deployment of the new Civilian Public Service in the park in September 1942. The CPS was a national service organization for conscientious objectors, men whose pacifist convictions prevented them from serving in the military. The men in the CPS were known as draftees because they had been drafted by the Armed Services and were inducted into the CPS as an alternative to participation in the war. The CPS draftees came to Glacier just as the chief ranger, five rangers, and a number of the standing fire organization’s regular fire guards and

⁷⁷ George C. Ruhle, “Glacier’s Changing Forests,” *Glacial Drift* 9, no. 1 (April 1936), 10-11.

⁷⁸ Rothman, *Blazing Heritage*, 72-73.

⁷⁹ *Ibid*, 82-83.

lookouts went into the military. At the same time, the park hired two women to fill vacant seasonal ranger positions and it trained dozens of volunteer firefighters in nearby communities. In May 1943, all CPS draftees, numbering about 150 men, were given three days of intensive fire training. Like the fire guards and CCC crews in the 1930s, the CPS men built and maintained trails, worked on telephone lines, accomplished fire hazard reduction, and performed other tasks related to fire prevention.⁸⁰ The CPS camp in Glacier was operational from 1943 to 1945.

In Missoula and numerous other locations in the West, CPS draftees proved their mettle as volunteer smokejumpers when the Forest Service began experimenting with this new approach to fire suppression during World War II. The CPS men in Glacier did not have that opportunity, but they did work on ground crews in conjunction with the first use of smokejumpers in Glacier in late August 1945. In fact, one ground crew of five CPS men, led by District Ranger Fred Hodgson, who had recently returned to the park after two years of military service, played a key part in putting out the Lincoln Peak Fire. Director Newton B. Drury specifically noted the contributions of the CPS in a letter to Congressman Compton I. White.⁸¹

The park's first use of smokejumpers received close attention. Early in the morning on August 25, a severe lightning storm ignited numerous fires in the park. With many of the CPS men already deployed on fire lines on the Flathead National Forest, it was evident that the park's fire organization was "spread very thin" and lacked the "reserve striking power" necessary to deal with blow-ups. Therefore, at 7:20 a.m., the park contacted the Forest Service's Region One office in Missoula and requested smokejumpers. No airplanes were available until mid-morning, but an airplane with six smokejumpers on board departed from Missoula at 10:30 a.m. Two smokejumpers dropped on Lincoln Peak at 12:15 p.m. and four more dropped at two locations on Mt. St. Nicholas at approximately 1:30 p.m. Ground crews, meanwhile, set out about 7:45 a.m. and reached the Lincoln Peak Fire at 4:50 p.m. and the Mt. St. Nicholas Fire at 5:00 p.m. Thus, the smokejumpers reached the fires about three hours sooner than the ground crews. In the post-fire analysis, Chief Ranger B. R. Finch thought that the timing had made a crucial difference in at least one instance and perhaps others as well. He noted that the smokejumpers not only arrived on the scene sooner, but also in relatively fresh condition. Ground crews arrived after several hours of wearying foot travel. This was especially significant in the case of the three fires on Mt. St. Nicholas, where the ground

⁸⁰ Glacier National Park, *Annual Report, 1943*, typescript, p.5-6, 13-14.

⁸¹ Chief Ranger to Superintendent, October 1, 1945, and Newton B. Drury to Compton I. White, September 25, 1945, File 883-01, Box 71, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

crew arrived in a state of exhaustion after a steep, cross-country traverse of three and a half miles at approximately one mile per hour. “We are convinced that the use of jumpers on these three fires saved putting in a camp and a larger crew,” Chief Ranger B. R. Finch wrote in his detailed memorandum on the park’s first use of smokejumpers.⁸²

Hand-in-hand with its use of aircraft and smokejumpers, Glacier National Park strengthened its ties to the Forest Service for assistance in overall fire detection and suppression. While the Forest Service was recognized as the lead federal agency in fire protection, the park developed cooperative agreements with all its neighbors, including the Flathead National Forest, Lewis and Clark National Forest, Blackfeet Agency, and Waterton Lakes National Park. The cooperative agreements were important for dealing with fires that started on one side of a boundary and crossed to adjacent lands belonging to another agency. It was agreed, for example, that employees of either agency could take initial action on fires “within zones of mutual interest,” and that control measures would not be abandoned “simply because a fire has reached the boundary or crossed into the other’s territory.”⁸³ These cooperative agreements grew more elaborate in the late 1940s and 1950s, prescribing how emergency needs would be prioritized and how each party would be reimbursed by the other for contributed resources.

Use of Forest Service smokejumpers in Glacier and Yellowstone was described in a memorandum of understanding between the regional director for the National Park Service and the regional forester for the U.S. Forest Service. The Forest Service agreed to train, equip, and maintain ready for immediate dispatch to either park six smokejumpers for a period of three months each year. The Park Service agreed to pay costs as stipulated. The agreement also set out conditions by which the smokejumpers could be deployed to fires on national forests.⁸⁴

As interagency cooperation improved and the Park Service was drawn even closer into the Forest Service’s orbit, the two agencies’ mutual conception of forest fire protection came to resemble an ideology. A cooperative agreement between Glacier National Park and the Flathead National Forest in 1950 carried the following paragraph:

⁸² Chief Ranger to Superintendent, October 1, 1945, File 883-01, Box 71, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁸³ “Cooperative Fire Fighting Agreement Between the Superintendent of the Blackfeet Agency, the Supervisor of the Lewis and Clark National Forest, and the Superintendent of Glacier National Park,” 1944, included as Appendix E in “Forest Fire Control Plan,” March 1965, File Y14, Box 34, Numerical Subject Files 1949-65, RG 79, NA-RMR.

⁸⁴ Regional Director to Regional Forester, May 7, 1947, enclosing Memorandum of Understanding between the Regional Director, National Park Service, Region Two, Department of Interior and the Regional Forester, U.S. Forest Service, Region No. One, Folder 10, Box 304, GNP Administrative Records, GNP Archives.

Each protective agency has a mutual purpose in aiding the other in the control of all fires endangering their respective lands. The objective shall be to reach and extinguish every fire as quickly as possible, whether man-caused or lightning-caused and whether originating within its developed sections or in its wilderness areas. Fire suppression shall take precedence over all other activities except the safeguarding of human life. The policy shall be to reach and combat every fire with such dispatch, strength of personnel and equipment as to confine it to the least possible acreage and damage, and in any event, to gain control before the burning period of the second day. Fire knows no boundaries and in order to cope with this menace, the ultimate in cooperation is essential. It is with this in mind that the following agreement is entered into by the officers of the Flathead National Forest and Glacier National Park.⁸⁵

In 1954, Glacier submitted a plan to improve its fire protection organization with the addition of a spotter airplane and two more smokejumpers, and the closure of four lookouts. The existing organization consisted of 21 permanent rangers, 25 seasonal positions, plus the park's half interest in the 6 smokejumpers based at the U.S. Forest Service's smokejumper base in Missoula. A second tier of firefighters was composed of the road and trail maintenance crews and other park crews, which totaled approximately 135 to 150 men during the fire season. After ten years of experience with aerial surveillance and smokejumpers, park officials believed that they could fairly assess the cost of air operations versus ground operations in forest fire protection, and they put forward the plan as a cost saving measure as well as an improvement in firefighting capability. This plan was approved.⁸⁶

Air operations played an important part in the success of fire suppression efforts in the postwar era. From 1910 to 1930, forest fires in Glacier burned approximately 175,000 acres. From 1930 to 1945, forest fires burned about 11,850 acres of park land. From 1945 to 1955, the amount fell to just 126 acres.⁸⁷

⁸⁵ "Cooperative Firefighting Agreement between the Superintendent of Glacier National Park and the Supervisor of the Flathead National Forest," August 1950, File 883-07, Box 72, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁸⁶ Superintendent to Regional Director, March 24, 1954, enclosing Fire Control Reorganization and Revision of Fire Control Step-Up Plan for Glacier National Park, File Y14, Box Y4, Region II General Files 1952-64, RG 79, NA-CPR; Glacier National Park, *Annual Report, 1954*, typescript, p. 15.

⁸⁷ Glacier National Park, "Fire Control Plan," 1955, File Y14, Box Y4, Region II General Files 1952-64, RG 79, NA-CPR.

The smokejumpers compiled an impressive record. In a dozen years, from 1945 to 1957, a total of 36 men dropped on 11 separate fires. The smokejumpers usually dropped in pairs, sometimes in groups of three, and sometimes in groups of five. No injuries occurred in the course of all these drops.⁸⁸

One more component of the fire protection effort in this era deserves mention. The Park Service joined the Forest Service in a campaign of public education summed up by the slogan, “Remember, only YOU can prevent forest fires.” The record showed that human carelessness was the cause of numerous fires, so changing people’s behavior was a proactive way to reduce the number of fires. Interpretive rangers bent to the task, signs and posters were put up in campgrounds and visitor facilities, lookouts were instructed to engage hikers on the subject, and camping permits were used to educate campers on how to put out their campfires. During periods of extreme fire danger, smoking was restricted. As a result of the public education campaign, incidents of human-caused fire declined relative to incidents of lightning-caused fire. These gains were particularly impressive in light of increasing visitor use. As the number of lightning-caused fires actually increased, however, resource managers faced the awkward possibility that fire suppression might be producing unnatural fuel build-ups. Another possibility was that aerial detection was driving up the number of reported fires, many of which might have burned out without being noticed in former years.⁸⁹

In 1963, the Leopold Committee pointed out that suppression of natural fire was having negative consequences for wildlife habitat. But the ideology of all-out fire suppression was so entrenched that the influential Leopold Report had absolutely no impact on Glacier’s fire control plan. This plan, updated yearly and running to 50 pages in length by this time, stated that the park’s policy was “to completely extinguish all uncontrolled fires resulting from whatever cause, in the shortest possible time and with the least possible damage to Park resources.” Even as Everglades National Park and a few other units in the national park system experimented with prescribed natural fire, Glacier remained firmly committed to the Forest Service’s vaunted “10 a.m. policy.” This was the rule that all uncontrolled fires should be brought under control by 10 a.m. on the day following detection.⁹⁰

⁸⁸ Acting Superintendent to Director, September 13, 1957, File Y14, Box Y4, Region II General Files 1952-64, RG 79, NA-CPR.

⁸⁹ Rothman, *Blazing Heritage*, 80-81.

⁹⁰ Glacier National Park, “Forest Fire Control Plan,” 1965, File Y14, Box 34, Numerical Subject Files 1949-65, RG 79, NA-RMR.



3.7 Forest Pathogens

If there was virtually no difference between the Park Service's and the Forest Service's respective stands on forest fire protection in the middle decades of the twentieth century, there was only a sliver of daylight between the two agencies in how they addressed forest pathogens. When forests suffered from insect infestation, disease, severe drought, air pollution, or any other type of blight, the Forest Service saw the problem essentially in monetary terms: dead trees depreciated the forest's value. The Park Service, while broadly sympathetic to the Forest Service's aversion to forest blights, regarded the problem from an aesthetic and ecological standpoint. Park managers gradually came to recognize that insect infestations and tree diseases were integral parts of forest ecology. As such they had a place in national parks even if most park visitors found the effects unsightly. The problem was less nuanced when forests were ravaged by exotic tree diseases, however. Viewing such pathogens as unnatural, park managers cooperated wholeheartedly with the Forest Service in efforts to control them.

The important distinction between natural forest pathogens and those caused by introduced parasites was brought out clearly in a report titled "The Forest Pathology of Glacier National Park," by E. P. Meinecke of the Bureau of Plant Industry, in 1930. Meinecke suggested that the park administration take a benign view of forest pathologies that were indigenous to the region, because native forests were adapted to withstand such attacks. At the same time, he thought the Park Service should maintain the utmost vigilance toward introduced forest diseases such as white pine blister rust, since they were unnatural and potentially very destructive. Director Albright recommended the report highly to Glacier's superintendent, chief ranger, and park naturalist.⁹¹

Meinecke's distinction between native and exotic forest pests took hold slowly. In the early 1930s, Glacier cooperated with the Forest Service and the Bureau of

⁹¹ Director to Superintendent, July 25, 1930, enclosing "The Forest Pathology of Glacier National Park" by E. P. Meinecke, File 884-03, Box 255, Central Classified Files 1907-49, RG 79, NA II.

Entomology in attempting to control outbreaks of the mountain pine beetle, a native insect. Park managers were chiefly concerned about whether the park was acting as a pathway for the spread of the infestation to national forests on the east side of the Continental Divide. Altogether, a few thousand trees covering an expanse of several thousand acres were treated.⁹² In 1953, Glacier consented to the use of chemicals in the Nyack area to control an outbreak of the spruce beetle, another native. The main point was to assist the Forest Service in protecting merchantable timber on the Flathead National Forest, since it was feared that control efforts on the national forest would be futile if infested trees were left bordering the national forest on the other side of the boundary.⁹³ Again in 1956, Glacier consented to the use of a pesticide against a native insect, this time in the upper McDonald Creek drainage to control an outbreak of the western spruce budworm (*Choristoneura occidentalis*). The treatment involved aerial spraying of DDT. Wildlife ranger A. D. Cannavina and wildlife biologist Walter Kittams both advised against the application of DDT. “Insects deserve consideration as natural phenomena,” Kittams wrote, amplifying on what Meinecke had said many years earlier. “They serve in various roles as pollenizers [pollinators] of flowers, checks upon plants, other insects and perhaps larger animals such as scavengers. Killing a major portion of insects and other invertebrates would result in numerous temporary changes in life processes in the area.”⁹⁴ But the biologists were overruled.⁹⁵

Glacier’s most sustained effort to control a forest infestation was aimed at arresting white pine blister rust. This forest disease was introduced from Europe to eastern North America around 1898 and to the Pacific Coast probably in 1910. It took hold in the eastern United States and eastern Canadian provinces in the first two decades of the twentieth century, and it spread from the Pacific Coast to the Intermountain West in the 1920s. Five infected whitebark pines were discovered in the Two Medicine area in

⁹² Glacier National Park, *Annual Report, 1932*, typescript, pp. 16-17; Glacier National Park, *Annual Report, 1934*, typescript, p. 5.

⁹³ Superintendent to Regional Director, April 24, 1953, File Y22, Box Y5, Region II General Files 1952-64, RG 79, NA-CPR.

⁹⁴ Biologist to Superintendent, November 2, 1956, and Supervisory Park Ranger to Superintendent, October 26, 1956, File Y22, Box Y5, Region II General Files 1952-64, RG 79, NA-CPR.

⁹⁵ Superintendent to Regional Director, November 4, 1957, enclosing Report on the Black-headed Budworm Control Program in Glacier National Park – 1957, File Y22, Box 15, Numerical Subject Files 1949-65, RG 79, NA-RMR. Also see “Planes Spray McDonald Forest,” *Hungry Horse News*, July 26, 1957. In this generally supportive article, DDT was described as an effective insecticide and not a threat to other wildlife. “Another interesting report is that there was no noticeable lack of birds in the area sprayed this week,” the article stated. “They are still singing.”

1939 in what was believed to be the first known occurrence of the disease east of the Continental Divide in the western United States.⁹⁶

In 1939, the standard method of control of white pine blister rust was to eradicate “ribes,” or wild currant and gooseberry bushes, within a wide radius of each infected pine tree. This was because the fungus that causes blister rust spends part of its life cycle on the host organism *Pinus* and the other part of its life cycle on an alternate host plant in the genus *Ribes*. By eradicating ribes, infected trees were effectively quarantined and the disease cycle was interrupted. In the early days, removing ribes was mostly accomplished by hand pulling. As one author has stated, “With many *Ribes* spp. widely spread over the continent wherever white pines grew, this task amounted to ecological warfare on a biblical scale.”⁹⁷

Around the time that Glacier joined in the massive white pine blister rust control effort, experts began to have doubts about this method, especially in the West where white pine grew in mountainous terrain and ribes often grew in thick patches on steep slopes. Even after an area was cleared it had to be maintained or else the ribes and the disease would reappear. There were wave years in which the disease spread aggressively and the control effort lost ground. By the early 1960s, ribes eradication was largely replaced by another method of control using a chemical called Actidione BR. Applied as an antibiotic to the base of each infected tree, it migrated up the tree and killed the individual blister rust cankers directly. However, after several years the antibiotic treatment began to fail for reasons that remained unclear. Controversy over the antibiotic program finally brought an abrupt halt to blister rust control in 1967. By then, experts felt encouraged that a new genetics-based approach which sought to propagate blister rust resistant white pine would soon turn the corner on the disease.⁹⁸

In Glacier, white pine blister rust control began with ribes eradication and progressed to antibiotic treatment in the early 1960s. Treatment areas covered a total of 13,900 acres, with ribes eradication units covering a little less than half the total and antibiotic treatment areas covering the rest. Ribes eradication units were located at Two Medicine Lake, Oldman Lake, Nyack, along the east shore of Lake McDonald, and around park headquarters. Antibiotic treatment was most extensive on Howe Ridge and in the upper McDonald Creek drainage. In 1965, all stands of white pine in the park were

⁹⁶ W. C. Riley, “Blister Rust Control, Glacier National Park, 1944,” Folder 12, Box 284, GNP Administrative Records 1910-1984, GNP Archives; Bohun B. Kinloch, Jr., “White Pine Blister Rust in North America: Past and Prognosis,” *Phytopathology* 93, no. 8 (2003), 1044; Otis C. Maloy, “White Pine Blister Rust Control in North America: A Case History,” *Annual Review of Phytopathology* 35 (1997), 98.

⁹⁷ Kinloch, “White Pine Blister Rust in North America,” 1045.

⁹⁸ Maloy, “White Pine Blister Rust Control in North America,” 98-105.

described as “heavily infested,” while stands of white bark pine and limber pine were affected, too. Resource managers were poised to extend use of Actidione BR into several other areas in the park.⁹⁹

After Rachel Carson awakened the nation to the peril of indiscriminate pesticide use with her bestselling book *Silent Spring*, the Park Service slowly backed off chemical treatments – a change of philosophy that happened to coincide with the end of the white pine blister rust control program. The Leopold Report in 1963 warned against mass application of pesticides. Shortly thereafter, Secretary of the Interior Stewart L. Udall announced a new policy on pesticide use with emphasis on more stringent guidelines and procedures. The Park Service, along with all Interior agencies, was directed to give priority to non-chemical control methods. Glacier, along with all other units in the national park system, had to prepare an individual project proposal for each contemplated use of toxic chemicals. Proposals were submitted to the regional office for approval by a newly appointed Pesticides Review Committee.¹⁰⁰ The new outlook on pesticide use added force to the perspective that had long been espoused but seldom upheld in Glacier – that forest pathogens should often be allowed to run their course.

It was rare that parks responded to external threats of air pollution in this era, but Glacier faced such a threat in the early 1950s. In the summer of 1950, Superintendent Emmert learned that the Anaconda Copper Mining Company planned to build an aluminum reduction plant near Columbia Falls not far from the west entrance to the park. The plant was to be located so as to take advantage of hydroelectric power from the Hungry Horse Dam. Emmert was concerned of potential damage to Glacier’s forests. Similar plants located in Spokane, Washington and Portland, Oregon, Emmert discovered, caused considerable damage to vegetation for many miles around. The main chemical agent implicated in the destruction of nearby forests was fluorine. Studies showed that airborne fluorine weakened the trees, which then succumbed to attacks by

⁹⁹ “Blister Rust Control, Glacier National Park,” annual reports for 1941 to 1952, Folder 12, Box 284, GNP Administrative Records 1910-1984, GNP Archives; Assistant Regional Forester to Superintendent, April 24, 1962, and Forester to Regional Director, November 7, 1962, File Y22, Box 16, Numerical Subject Files 1949-65, RG 79, NA-RMR; Supervisory Park Ranger to Chief Park Ranger, July 16, 1965, File Y22, Box 34, Numerical Subject Files 1949-65, RG 79, NA-RMR; Acting Superintendent to Superintendent, Yellowstone, November 6, 1964, File Y22, Box 16, Numerical Subject Files 1949-65, RG 79, NA-RMR.

¹⁰⁰ News release, “Secretary Udall Testifies on Pesticide Problems, Warning of Environmental Hazards,” May 22, 1963, Regional Director to All Field Offices, June 19, 1964, Secretary of the Interior to Assistant Secretaries, August 21, 1964, Acting Regional Director to All Field Offices, October 5, 1964, and Acting Regional Director to Paul T. Quick, Regional Director, Bureau of Sport Fisheries and Wildlife, November 10, 1964, File Y22, Box 15, Numerical Subject Files 1949-65, RG 79, NA-RMR.

insects or diseases. Besides the potential effects on the forest, Emmert worried that air pollution from the plant would carry an odor that would be detectable by park visitors.¹⁰¹

Forest Service officials joined with Emmert in expressing concerns. The Flathead National Forest was even closer to the proposed smelter site. Regional Forester Percy D. Hanson shared copies of his correspondence on the matter with Emmert. The Park Service and the Forest Service were jointly interested in knowing what harm the aluminum reduction plant might cause to natural resources, whether the plant could be located farther away from those resources, and what steps the company would take to install equipment that would reduce the toxicity of smelter fumes.¹⁰²

Director Conrad Wirth contacted Horace Albright, the former director, who had retired from federal service to pursue a second career in the mining industry. Albright, still avidly interested in national park issues, agreed to intercede on the park's behalf with people he knew in the Anaconda Copper Mining Company. Whether Albright's influence was decisive cannot be known, but when the company's plans finally crystallized in 1952, the company selected a different site for the aluminum reduction plant. Although park officials had hoped that the plant might be located at another proposed site near Kalispell, the site near Columbia Falls that the company decided upon was in Wirth's words, "the next least objectionable."¹⁰³ The Anaconda Aluminum Plant went into production in August 1955. The park would continue to concern itself with air pollution emanating from the plant until its closure in 2008.



3.8 Glacier View Dam

A more alarming external threat to Glacier National Park came in the shape of a proposed dam that would have impounded waters of the North Fork of the Flathead

¹⁰¹ Superintendent to Regional Director, August 17, 1950 and August 18, 1950, File 883, Box 71, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

¹⁰² Superintendent to Regional Director, September 12, 1950, Regional Director to Anaconda Copper Mining Company, January 16, 1952, File 883, Box 71, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

¹⁰³ Hillory A. Tolson to Horace M. Albright, February 6, 1952, Albright to Tolson, February 7, 1952, Tolson to Albright, February 10, 1952, Albright to Tolson, March 3, 1952, Albright to Conrad L. Wirth, April 10, 1952, and Wirth to Albright, April 18, 1952, File 883, Box 71, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

River, inundating up to 20,000 acres of land within the park. The proposal arose after World War II and hung over the park like a specter for some twenty years. Park officials spoke out against it, local conservation groups formed to oppose it, and the Sierra Club took up the cause as a part of its national campaign against an array of dam projects.

The dam proposal had its origins during World War II when the U.S. Army Corps of Engineers was tasked to find potential reservoir sites in the Flathead River Basin to meet the water supply needs of the Bonneville Authority and the Grand Coulee Administration. The Corps made a preliminary finding of a suitable location for a dam located on the North Fork of the Flathead River between Huckleberry Mountain in the park and Glacier View Mountain on the Flathead National Forest. Superintendent Libbey informed the regional director of the proposal in July 1943. Libbey suggested at that time that the Park Service carefully weigh the threats to the park against whatever advantages the reservoir offered. “The situation is acute and demands very careful scrutiny and careful handling,” Libbey wrote, noting that at this early stage the dam proposal already had the support of many Montanans.¹⁰⁴

Over the next two years, as the Corps of Engineers made test borings and performed other tasks to advance its preliminary finding, the Park Service hardened its position. Commenting on the Corps’ draft Columbia River Basin report, Superintendent Emmert noted the effects that the reservoir would have on wilderness values, scenic values, and big game (which would be deprived of important winter range) and stated unequivocally, “It is our opinion that the effect would be extremely disastrous.” Regional Director Lawrence C. Merriam, forwarding these comments to the director, stated that he was in full agreement with Emmert and added some concerns of his own.¹⁰⁵ Meanwhile, the Park Service sought to put stricter parameters on the Corps’ ability to investigate dam sites that would encroach on national parks. Director Drury wanted to limit such investigations to projects specifically authorized by Congress. Regional Director Merriam told the superintendent of Glacier to refuse a request by the Corps to make more test borings in the park. “This is the type of proposal which we feel...should be taken up by the Secretary of War with the Secretary of the Interior,” Merriam instructed.¹⁰⁶

¹⁰⁴ Superintendent to Regional Director, July 17, 1943, Folder 3, Box 228, GNP Administrative Records 1910-1984, GNP Archives.

¹⁰⁵ Regional Director to Director, June 8, 1945, Folder 3, Box 228, GNP Administrative Records 1910-1984, GNP Archives.

¹⁰⁶ Newton B. Drury to Mr. Demaray, October 29, 1945, enclosing Order No. [blank], and Regional Director to Superintendent, July 20, 1944, Folder 1, Box 14, GNP Administrative Records 1910-1984, GNP Archives. Permission for test borings was formally granted by the Secretary of the Interior to the Secretary of War by letter of January 3, 1946, same file. For more on Drury’s resistance to dam proposals,

The Corps of Engineers presented its Glacier View Dam proposal at a public hearing held in Kalispell in May 1948. The Park Service strenuously objected to the loss of land that the project would entail, estimating that it would eliminate 56 percent of winter range for the white-tailed deer in the area, 30 percent of winter range for elk and mule deer, 50 percent of moose habitat, 70 percent of beaver habitat, and considerable fish habitat. Furthermore, fluctuations in reservoir level and exposed mud flats would critically impair scenery.¹⁰⁷ Due in part to effective public outreach by the park, public testimony at the hearing was mainly opposed to the dam. Immediately afterwards, Secretary of the Interior Julius Krug told a group of citizens that he would oppose the dam unless the Corps could demonstrate it was vital to the national defense, and later the Secretary of the Army consented to delete the Glacier View project from its plan for water development in the Columbia River Basin.¹⁰⁸ But in the next session of Congress, Representative Mike Mansfield (D-MT) introduced a bill to provide for the construction of the Glacier View Dam. Although the bill failed in Congress, it revived interest by the Corps of Engineers and the dam's advocates in the Kalispell Valley.¹⁰⁹

With the Park Service maintaining its strong stand against the dam, local residents and chambers of commerce came to the park's defense. Opposition by North Fork Valley residents was vociferous, and the park's hotel and transportation concessions joined in the protest. National conservation organizations including the Wilderness Society and the National Audubon Society made the threat to Glacier a national issue.¹¹⁰

The Park Service then went on the offensive. Not content to stake its defense of Glacier primarily on ecological concerns, the Park Service pointed to the park's importance for tourism. In 1952, it embarked on preliminary plans and drawings to improve the primitive road up the North Fork Valley. The development concept was to turn the existing road into a primary road which would connect with a new road over Akamina Pass in Waterton Lakes National Park. Linking up with the east-side road and the Going-to-the-Sun Road, the North Fork-Akamina Road would have created a "circle tour" through and around the two adjoining parks. The proposed road's underlying

see Byron Pearson, "Newton Drury of the National Park Service: A Reappraisal," *Pacific Historical Review* 68, no. 3 (1999): 397-424.

¹⁰⁷ Corps of Engineers, *Smoky Range Project*, December 20, 1955, File L2415, Box 25, Numerical Subject Files 1949-65, RG 79, NA-RMR.

¹⁰⁸ Acting Assistant Director to Lee Muck, October 28, 1948, Folder 3, Box 228, and Glacier National Park, "The Glacier View Dam Project," June 20, 1955, Folder 9, Box 212, GNP Administrative Records 1910-1984, GNP Archives.

¹⁰⁹ John Ise, *Our National Park Policy: A Critical History* (Baltimore: Johns Hopkins Press, 1961), 570.

¹¹⁰ Buchholtz, *Man in Glacier*, 71.

purpose was obvious: increased public access would lash the imperiled North Fork Valley firmly to the park.¹¹¹

In 1956, the Corps struck back with its own ploy, announcing an alternative proposal for a dam on the North Fork. The dam site was located nine miles downstream from the earlier site and was called the Smoky Range Dam. Instead of flooding 20,000 acres of the park, it would only flood 8,700 acres of the park. The park regarded the new proposal as no more acceptable than the earlier one; the same principles of keeping the national park inviolate still applied. The Corps faced renewed public opposition to the scaled-down proposal, and when the district engineer for the Corps opened a public hearing in Missoula in July 1956, he began by announcing that the project was to be withdrawn from consideration because of continued resistance by the Department of the Interior. Still the hearing provided a useful forum for local supporters of the dam project to tout the project's economic benefits, and the threat persisted.¹¹²

By the following decade, enthusiasm for the North Fork-Akamina Pass Road had cooled as the wilderness preservation movement gained force. The North Fork of the Flathead River was put forward as a candidate for the proposed new system of wild and scenic rivers. In 1965, wildlife ranger Bob Wasem prepared a report on how the Glacier View or Smoky Range dam projects would effect scenic and natural resource values. In contrast to the park's earlier emphasis on loss of winter range for big game, Wasem raised other concerns such as loss of the North Fork's unusual wet and dry meadows, including Big Prairie, and the adverse effect that a reservoir would have on rare species, including the northern bog lemming (*Synaptomys borealis chapmani*), the gray wolf, and the grizzly bear. The Fish and Wildlife Service prepared a report at the same time, with the recommendation that the Smoky Range Dam project should not be authorized for construction chiefly because it would significantly reduce the total fish and wildlife resources of the North Fork area and would have serious adverse effects for two sensitive species, the westslope cutthroat trout and the grizzly bear.¹¹³ The North Fork of the Flathead River did not get included among the eight components that initially composed the national wild and scenic river system established in 1968, but it was designated a national wild and scenic river in 1975.

¹¹¹ Glacier National Park, *Annual Report, 1952*, typescript, p. 4, copy provided by GNP Archives.

¹¹² Superintendent to Regional Director, March 9, 1956, and August 6, 1956, File L2415, Box 16, Numerical Subject Files 1949-65, RG 79, NA-RMR; "Army Eyes Substitute for Site for Glacier View," *Daily Inter Lake*, March 7, 1956.

¹¹³ C. Robert Wasem, "Glacier View and Smoky Range," March 25, 1965, and Regional Director, Bureau of Sport Fisheries and Wildlife to Superintendent, October 27, 1965, enclosing draft report, File L2415, Box 35, Numerical Subject Files 1949-65, RG 79, NA-RMR.



3.9 Dams on the East Side

Glacier's establishing act gave the U.S. Reclamation Service a claim to any area within the park that might be "necessary for development and maintenance of a Government reclamation project."¹¹⁴ The Reclamation Service (later the Bureau of Reclamation, or BOR) exercised that prerogative when it built Sherburne Dam in 1919 to augment the water supply for the Milk River Irrigation Project. While the dam was located outside the park, it created a reservoir on Swiftcurrent Creek extending four miles inside the park almost to Many Glacier. The original earthen dam was 107 feet in height above its foundation, and 4,803 above sea level at its crest. It was designed to control the reservoir at an optimum level of 4,788 feet elevation. With spillway gates closed, the reservoir level could be increased another five feet to a maximum of 4,793 feet, or ten feet below the dam's crest. While the Park Service did not object to this project when it was conceived, it resisted later moves by the BOR to raise the height of the dam.¹¹⁵

In 1955, the BOR informed the Park Service that the floodgates on the aging structure needed replacement. The BOR proposed to fill the old spillway and construct a new one, raising the height of the dam in the process. When construction of the dam began, the Park Service noted slumping of the hillside and suggested that the project as planned would jeopardize the road that ran along the lakeshore even though the road itself was well above the 4,803-foot contour line.¹¹⁶ This caused the BOR to modify the plan. In 1960, a circumferential overflow spillway was built to replace the original spillway, which was filled with compacted earthen material. In 1982, the dam itself was reinforced, with both the dam crest and the spillway crest being raised twelve feet. This enlarged the storage capacity of the reservoir from 66,000 to 68,080 acre-feet.¹¹⁷

¹¹⁴ Tolson, *Laws Relating to the National Park Service*, 138-39.

¹¹⁵ Acting Director to Commissioner, Bureau of Reclamation, July 17, 1941, and Assistant Commissioner to Director, September 16, 1941, File L2415, Box 35, Numerical Subject Files 1949-65, RG 79, NA-RMR.

¹¹⁶ Regional Director to Director, July 29, 1955, File L2415, Box 35, Numerical Subject Files 1949-65, RG 79, NA-RMR.

¹¹⁷ Bureau of Reclamation, "Lake Sherburne Dam" (February 23, 2009), at <http://www.usbr.gov> <January 16, 2010>.

A parallel situation existed in the Two Medicine area. In 1912, the Reclamation Service built a dam just below the natural outlet of Lower Two Medicine Lake to impound water for the Blackfeet Irrigation Project. The enlarged lake had a storage capacity of 13,500 acre-feet and at full pool extended a little more than one mile into the park. The original plan contemplated eventual enlargement of the dam and reservoir to create a storage capacity of 48,000 acre-feet. In 1937 and 1938, the water level was raised and the storage capacity was increased marginally to 16,000 acre-feet. The original plan for enlargement was set aside at that time owing to the fact that the Glacier Park Hotel Company had developed visitor-use facilities along the lakeshore. Furthermore, the raised lake level would have inundated Trick Falls, a natural feature and popular attraction near the head of the lake. But two and a half decades later the original plan was revived. In 1962, representatives of the Blackfeet Indian Agency informed park officials that they wanted to build a new dam in place of the old one that would increase the storage capacity of Lower Two Medicine Reservoir to 40,000 acre-feet and raise the lake level to 4,903 feet elevation. As in the case of Lake Sherburne Dam, the 1910 law did not protect the park and the Park Service could do little more than protest the new construction initiative.¹¹⁸

In this case, however, nature intervened. In June 1964, the Glacier region was hit by severe floods. The Lower Two Medicine Reservoir was at full capacity and the dam gave way. In the wake of the disaster, Montana's senators had moneys included in the Interior Appropriations Act for replacement of the structure. The plan to enlarge the reservoir was superseded by an investigation of alternative dam sites. Senator Lee Metcalf (D-MT) became irritated with the Bureau of Indian Affairs over a statement made by the deputy commissioner of Indian affairs that seemed to imply that he had given carte blanche for the agency to rebuild a bigger dam at the original site. As a result of this flap, Congress approved an alternative plan that combined reconstruction of the dam to its original size and reconstruction of another dam on Birch Creek, south of the park and adjoining the Lewis and Clark National Forest. Thus, further modification of Lower Two Medicine Lake by a reclamation project was narrowly averted.¹¹⁹

¹¹⁸ "Lower Two Medicine Lake, July 1964," File L2415, Box 18, Numerical Subject Files 1949-65, RG 79, NA-RMR.

¹¹⁹ "Metcalf Charges Dishonesty in Plan for Relocating Two Medicine Dam," *Great Falls Tribune*, August 22, 1964; "Work on Two Medicine, Swift Dams Is Under Way," *Great Falls Tribune*, October 7, 1965, Regional Director, Bureau of Reclamation, to Area Director, Bureau of Indian Affairs, December 31, 1964, and Assistant Director to Director, January 15, 1965, File L2415, Box 35, Numerical Subject Files 1949-65, RG 79, NA-RMR.

Chapter 4

A Vignette of Primitive America



4.1 The Leopold Report

In 1963, Secretary of the Interior Stewart Udall appointed an advisory board of five scientists to review wildlife management in the national parks and make recommendations. Serving as chairman of the committee was A. Starker Leopold, professor of zoology at the University of California at Berkeley, and son of renowned environmental philosopher Aldo Leopold. The committee's report, which soon became known as the Leopold Report after its principal author, signaled a new direction in natural resources management in the national park system. It proposed that the primary goal of park management should be to maintain, or where necessary *recreate*, the conditions that prevailed when the area was pristine. In pursuit of this ideal, the Park Service needed to take active measures to manipulate the environment, such as reintroducing species that had been extirpated from the area, controlling the spread of "exotic" or invasive species, and making use of fire, among other tools, to restore habitat conditions that had been altered by logging, grazing, and fire suppression. In support of this program, the Park Service needed to develop a stronger research capability. Up to this point, research in the parks had been oriented to the interpretive functions rather than to management. "We urge the expansion of the research activity in the Service to prepare for future management and restoration programs," the Leopold Report stated.¹

¹ A. S. Leopold, et al., "Wildlife Management in the National Parks," in Dilsaver, ed., *America's National Park System: The Critical Documents*, 237-252.

Secretary Udall appointed the advisory committee to review policy in the face of demands by some sport hunters' groups that the Park Service use sport hunting as a tool for controlling wildlife populations in national parks. The advisory committee used the opportunity to address the larger question of nature preservation and the meaning of national parks. While reaffirming the principle that no public hunting should be allowed, it couched its response to that issue in much broader terms. Conservationists embraced the report's broad-ranging conclusions, and Secretary Udall directed the Park Service to adopt the report's findings as policy. The landmark document, appearing one year before the Wilderness Act, served as a pivot point for a subtle shift in Park Service priorities toward the preservation side of its dual mission.²

Not since *Fauna in the National Parks* (1932), or perhaps the Organic Act of 1916, had there been such a clear statement of purpose for natural resource management. The Leopold Report stated:

As a primary goal, we would recommend that the biotic associations within each park be maintained, or where necessary recreated, as nearly as possible in the condition that prevailed when the area was first visited by the white man. A national park should represent a vignette of primitive America.³

In fact, the Leopold Report made many of the same points that George Wright and his team had made thirty years earlier in their important monograph, but in the social context of the 1960s the same points became more penetrating. Both sets of authors began with the same premise that a fundamental purpose of national parks was to provide for public appreciation of nature within a historical framework. Since nature was in a constant flux, both reports observed, preserving an area in its natural state required resource managers to establish a relevant horizon at some point along a historical continuum which would be designated as "pristine." That time horizon, both reports agreed, should logically be the point in time when Euro-American land uses first appeared. The next step for natural resource managers was to conduct historical research and develop an understanding of this past primitive condition with a view to restoring it. Complete ecological restoration would never be attainable, but it would be the resource managers' guiding star to assure consistency. In the words of the Leopold Report, "If the goal cannot be fully achieved it

² A. S. Leopold, S. A. Cain, C. M. Cottam, I. N. Gabrielson, and T. L. Kimball, "Wildlife Management in the National Parks," in Dilsaver, ed., *America's National Park System: The Critical Documents*, 237-51; Sellars, *Preserving Nature in the National Parks*, 214-17.

³ Leopold, et al., "Wildlife Management in the National Parks," 239.

can be approached. A reasonable illusion of primitive America could be recreated, using the utmost in skill, judgment, and ecologic sensitivity.”⁴

To a later generation, both Wright’s and Leopold’s efforts to define pristine with reference to the coming of the white man appeared to smack of ethnocentrism. The definition coincided with popular myth, rooted deep in America’s past, that white men had discovered Eden and that aboriginal Indians were no more influential in shaping the natural world than the wild animals which they hunted. There was more to Wright’s and Leopold’s thinking than cultural bias, however. Firstly, they noted that to reach for any earlier time horizon would pose insurmountable difficulties due to the absence of written records. This point was an oversimplification but basically incontrovertible. Secondly, they noted that the rate of human-caused ecological change became substantially greater in the presence of European civilization. This point was undisputed but it was also tricky. They referred to ecological change *relative to the passage of time*. Neither Wright nor Leopold were contending that Indians had had no appreciable effect on ecology before the coming of Europeans. Nevertheless, their conception of natural resource management had the unintended consequence of marginalizing Indians. Historian C. W. Buchholtz carried this management bias into his history of Glacier National Park, *Man in Glacier*, in which he stated: “The Native Americans had the least impact upon Glacier. While they hunted for game, visited the lakes, and crossed the passes, they changed very little of what they found.”⁵ More recent scholarship on Indians in Glacier has countered this view, noting that Glacier’s ecology co-evolved with Indian land use practices over many centuries. Defining what was “pristine” remained a problematic element in the national-park-as-vignette-of-primitive-America paradigm.

The Leopold Report restated other points made earlier in the Wright survey. Like *Fauna in the National Parks*, the Leopold Report stressed that mere protection was not a sufficient policy; the goal of ecological restoration must be pursued through habitat manipulation. In the earlier report, the authors wrote: “The need to supplement protection with more constructive wild-life management has become manifest with a steady increase of problems both as to number and intensity.”⁶ The Leopold Report averred, “Protection alone, which has been the core of Park Service wildlife policy, is not adequate.”⁷ Some historians have read the history of Park Service resource management as a dialectic between interventionist and non-interventionist points of

⁴ Ibid, 240.

⁵ Buchholtz, *Man in Glacier*, 82.

⁶ Wright et al., *Fauna of the National Parks*, 105.

⁷ Leopold, et al., “Wildlife Management in the National Parks,” 250.

view.⁸ The Leopold Report was certainly a clarion call for intervention, just as *Fauna in the National Parks* had been earlier.

Where the Leopold Report differed from *Fauna in the National Parks* was in the level of effort called for. Wright's study had led to the creation of a Wildlife Division whose small coterie of biologists worked to accomplish first steps in introducing an ecological approach to resource management. By contrast, the vision put forth in the Leopold Report was both more ambitious and more sanguine about the challenges that lay ahead. It reflected not only the strengthened place of science and research in postwar America, but also the sober outlook of the dawning environmental era. After stating that the purpose of resource management in national parks was to preserve vignettes of primitive America, the Leopold Report continued:

The implications of this seemingly simple aspiration are stupendous. Many of our national parks – in fact most of them – went through periods of indiscriminate logging, burning, livestock grazing, hunting, and predator control. Then they entered the park system and shifted abruptly to a regime of equally unnatural protection from lightning fires, from insect outbreaks, absence of natural controls of ungulates, and in some areas elimination of normal fluctuations in water levels. Exotic vertebrates, insects, plants, and plant diseases have inadvertently been introduced. And of course lastly there is the factor of human use – of roads and trampling and camp grounds and pack stock. The resultant biotic associations in many of our parks are artifacts, pure and simple. They represent a complex ecologic history but they do not necessarily represent primitive America.⁹

The next section of the report on park management closed with the statement,

In essence, we are calling for a set of ecologic skills unknown in this country today. Americans have shown a great capacity for degrading and fragmenting native biotas. So far we have not exercised much imagination or ingenuity in rebuilding damaged biotas. It will not be done by passive protection alone.¹⁰

⁸ For example, see Pritchard, *Preserving Yellowstone's Natural Conditions*, 307-12.

⁹ Leopold, et al., "Wildlife Management in the National Parks," 240.

¹⁰ *Ibid*, 245.

The Leopold Report urged the Park Service to expand its research capacity. Wright had recommended that each park appoint at least one ranger who was trained in handling wildlife problems to work with biological experts in the Wildlife Division. The Leopold Report went much further. “Every phase of management,” the authors wrote, should come under the purview of “biologically trained personnel of the Park Service.”¹¹

The Leopold Report was followed five months later by the National Academy of Sciences Report. At the Park Service’s invitation, the National Academy appointed a committee to investigate science and research in the national parks. The committee chair, biologist William J. Robbins, was the principal author of the report. The National Academy’s report reinforced some of the points made in the Leopold Report, but phrased in a way that was more caustic than inspiring, the National Academy’s report had much less appeal in Park Service circles and received little play in the media. One point on which the two reports differed was how to integrate research and management. Citing ongoing investigations of the northern Yellowstone elk herd as a model, the Leopold Report urged that park managers and biologists work hand in glove on addressing problems in the field. The National Academy, on the other hand, wanted more separation between management and research. For park science to be credible, it argued, scientists in the field needed to be answerable to a separate line authority. Accepting the latter view, Director Wirth created a separate research program headed by a chief scientist and established research scientist positions in the field. These individuals reported directly to the chief scientist, with the object being to ensure that the research had more independence from park managers.¹²

Clifford J. Martinka became Glacier’s first research scientist in 1967. A protégé of Yellowstone biologist Glen Cole, Martinka expected to focus on elk habitat relationships in Glacier but soon found himself concentrating on grizzly bear ecology instead. Besides conducting research, Martinka administered the park’s overall research program, a responsibility he took over from the park naturalist. The research program consisted of more than 100 separate research projects underway by the U.S. Geological Survey, U.S. Weather Bureau, Fish and Wildlife Service, Forest Service, Montana Fish and Game Department, Montana State University, and 20 other colleges and universities. In former times, outside researchers often completed their projects and moved on without reporting results to park managers. One of Martinka’s responsibilities was to ensure that scientific research was shared with park managers, and that park management issues were

¹¹ Ibid, 242-43.

¹² Sellars, *Preserving Nature in the National Parks*, 215-16.

communicated to researchers. From the standpoint of outside researchers, the new requirements could be burdensome and even meddlesome, which was not the intention of the National Academy of Sciences report recommendations. Despite a few fractious breaks between park managers and independent scientists, however, Glacier and other national parks attracted more researchers as the scientific community increasingly valued national parks for their relatively pristine natural conditions.¹³

Meanwhile, the Park Service acted on the Leopold Report's recommendation to get more biologically trained personnel integrated directly into park management. At the national level, the Park Service created a new Science Division; however, at the park level, the ranger force would remain the first line of resource management in the parks through the 1960s and beyond. In Glacier, Ranger Charles R. Wasem was the lead ranger for wildlife management. Taking his cue from the Leopold Report, he prepared a history of fish management and a history of elk management. He then prepared management plans specific to bear, elk, ground squirrel, and small mammals. In 1966, he prepared a three-year research study proposal to examine elk-habitat relationships in Glacier, which led to the creation of Martinka's position.¹⁴

In June 1967, another member of Glacier's ranger force, B. Riley McClelland, was accepted into a new training program aimed at turning out resource management specialists. McClelland went to Colorado State University, Fort Collins, for a one year graduate seminar that was specially tailored to park rangers. At the suggestion of Lyle H. McDowell, chief of the Branch of Resources Management, McClelland prepared a professional paper for his master's degree on the ecosystem concept as applied to natural areas in the national park system. After completing the program, McClelland returned to Glacier in September 1968 and assumed the position of resource management specialist.¹⁵ In principle, he was to advise the superintendent on every phase of management affecting natural resources – just as the Leopold Report suggested.

What happened to McClelland three years later illustrates how every strong current of change in a bureaucracy – even a current as forceful as the one that flowed from the Leopold Report – inevitably catches a few unfortunate individuals in its back

¹³ Annual Research Report for 1963, Folder 1, Box 266, GNP Administrative Records 1910-1984, GNP Archives; James Habeck, interview by Theodore Catton, January 20, 2010; C. J. Martinka, "New Role for Science in National Parks," *Transactions of the North American Wildlife and Natural Resources Conference* 50 (1988), 369.

¹⁴ Acting Regional Director to Superintendent, January 27, 1965, enclosing wildlife management plans, File N16, and Superintendent to Regional Director, August 2, 1965, enclosing research study proposal, File N22, both in Box 36, Numerical Subject Files 1949-65, RG 79, NA-RMR

¹⁵ Lyle H. McDowell to Riley B. McClelland, June 20, 1967, Regional Director to Superintendent, July 12, 1968, and Riley McClelland – Employment History, documents provided to author by Riley McClelland.

eddies. In 1969, Glacier acquired a new superintendent, William J. Briggie. In Briggie, Director Hartzog had discovered an administrator who did not shy from making personnel shake-ups, and by late in the decade Hartzog had begun moving Briggie from park to park to serve in that very capacity. Briggie later recalled that when Hartzog asked him to go to Glacier, the director portrayed Glacier as “a pretty provincial situation.” Several of the key staff had been there a long time and were set in their ways. Although this characterization of the staff did not extend to the newly appointed resource management specialist, Riley McClelland, their personalities soon clashed. Briggie saw his primary task as being (in his own words) “organizational renewal” and “staff rejuvenation.” He needed to take a fresh look at personnel and budget needs and move some staff members out of their “comfort zones.”¹⁶ Briggie proceeded in the belief that he was snapping the park staff out of its lethargy. But the controversial superintendent’s detractors, including McClelland, saw his actions differently. At best, they thought Briggie was a throwback to a bygone era when the Park Service gave superintendents huge discretion to shape their park as they saw fit. Or worse – and this was McClelland’s view – they thought Briggie was philosophically miscast for the job of superintendent of Glacier since he seemed bent on managing the park as a recreation area instead of a natural area, to the park’s detriment. Briggie soon found McClelland to be a thorn in his side and made efforts to undermine him, first by barring the resource management specialist from involving himself in certain biological monitoring activity, and then by abolishing the position altogether. McClelland left the Park Service in 1973, declining the offer of a reassignment out of the park. He then sued the federal government for abusing the rules of civil service. After years of litigation, McClelland eventually won a judgment against the government.¹⁷ Briggie transferred to another park in 1974. Looking back on it 35 years later, McClelland did not mince words. By the time Briggie moved on, “he had thrown Glacier’s resource management program into total disarray and had offended the primary conservation organizations which previously had been very supportive of resource protection programs in the Park.”¹⁸ If this perhaps overstates the case, it is clear that Briggie acquired a reputation as a controversial and polarizing figure in the Park Service.

¹⁶ William Briggie, interview by Jennifer Bottomly, September 4, 2001, GNP Archives.

¹⁷ 606 F.2d 1278, *B. Riley McClelland v. Cecil D. Andrus, Secretary of the Interior, et al.*, No. 76-1654, United States Court of Appeals, District of Columbia Circuit, 1979.

¹⁸ B. Riley McClelland, personal communication with author, undated.



4.2 Wilderness Management

After the Leopold Report, the second major influence on Glacier's resource management in the last third of the twentieth century was the Wilderness Act of 1964. The movement to establish a national wilderness preservation system prompted debate about what qualities made "wilderness." For some it was primarily a matter of inaccessibility: wilderness could be defined as an area where only the hardest and most determined people could get. For others it was primitiveness, or the absence of human influences. For still others it was solitude, or the absence of other humans. In Park Service idiom, wilderness was the backcountry – the country beyond the road corridors and developed areas. Congress gave wilderness areas a legal definition in the Wilderness Act of 1964. Wilderness was "where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain." The act mandated that federal lands deemed worthy of legal wilderness status by the U.S. Congress would remain free of roads, mechanical transportation devices, and motorized equipment (except in cases of emergency or "as necessary to meet minimum requirements for the administration of the area"). The act established an initial national wilderness preservation system made up of well-defined units called "wilderness areas" in the national forests and prescribed a process for adding more areas to this system that were managed by other federal land management agencies, including the Park Service. The act gave the Park Service ten years to complete wilderness reviews of all roadless areas of 5,000 acres or more within the national park system and advise Congress (through formal secretarial recommendations) on the "suitability" of each area for wilderness designation.¹⁹

¹⁹ NPS recommendations for a one-third of potential wilderness areas in parks and monuments were due to Congress by 1967, two-thirds by 1970, and the remainder by 1974. The NPS came nowhere near meeting this schedule. The Wilderness Act of 1964 (78 Stat. 890).

Glacier National Park, like other national parks, made little headway on a wilderness proposal for several years. In 1970, conservationists began to criticize the Park Service for dragging its feet, and in response both Hartzog and the Nixon administration promised to expedite the reviews. Glacier completed its first wilderness proposal early in 1972; however, it was soon superseded by new administrative guidelines for wilderness recommendations released by the Nixon administration in June 1972. The park prepared its second wilderness proposal the following year, and the Park Service presented the plan at two public hearings at Great Falls and Kalispell in October 1973. After further revision, the plan was approved and submitted to Congress in March 1974, just six months before deadline.²⁰

Glacier's "Wilderness Plan" would have designated 927,550 acres, or 91 percent of the total area of the park, in three noncontiguous units of wilderness. Although Congress did not act on the plan, the wilderness recommendation remained influential because the Wilderness Act required federal agencies to treat all proposed, recommended, or designated wilderness under the same policy regardless of the area's final status. Thus, Glacier's recommended wilderness area acquired nearly the same level of protection under Park Service administration that it would have had under the Wilderness Act if Congress had designated it under the law.²¹

The Wilderness Act and the Park Service's wilderness review process brought forth two opposing responses by Glacier's resource managers. Some welcomed the Wilderness Act's mandates, believing that designation of wilderness under the law would only strengthen efforts to protect park resources in an unimpaired condition. Resource management specialist Riley McClelland urged that the park staff engage in a fulsome discussion of the wilderness plan, which he saw as "a golden opportunity to implement the ecosystem concept." In his view, wilderness designation would be "a positive step in the conservation of national park resources."²² Others were leery of the Wilderness Act, thinking that wilderness restrictions would unnecessarily encumber park management. Some of that resistance stemmed from hurt pride. Many in the Park Service felt that

²⁰ Director to Washington Office and Field Directorate, July 20, 1972, Folder 4, Box 221, GNP Administrative Records, GNP Archives; John M. Davis to Stanley W. Hulett, October 22, 1973, Folder 5, Box 221, GNP Administrative Records, GNP Archives; John C. Miles, *Wilderness in National Parks: Playground or Preserve* (Seattle: University of Washington Press, 2009), 200-04.

²¹ Glacier National Park, Midwest Region, National Park Service, Department of the Interior, *Final Environmental Statement, Proposed Wilderness Plan, Glacier National Park, Montana* (Washington: Department of the Interior, 1974), Exhibit A; U.S. Department of the Interior, National Park Service, *Management Policies 2001* (Washington: National Park Service, 2000), 65.

²² Resources Management Ranger to Chief Ranger, September 26, 1968, Folder 2, Box 221, GNP Administrative Records, GNP Archives.

national parks already exhibited the kind of land stewardship needed to protect wilderness values. Nowhere else in the national park system were those wilderness values more in evidence than in Glacier, which was renowned as a trail park, a wilderness enthusiast's haven. There may, too, have been lingering concerns that a national wilderness preservation system reaching well beyond the national park system would have the unintended consequence of devaluing wilderness values in the national parks. Some people in the Park Service had opposed the wilderness bill for fear that it would somehow lower park standards. However, the Wilderness Act specifically declares that designation of wilderness within national park system units "shall in no manner lower the standards evolved for the use and preservation" of those lands.²³

In the years following enactment of the Wilderness Act, when it became clear that the public wanted the Park Service to move ahead with wilderness recommendations, some in the Park Service responded by arguing that areas so designated in the national parks should meet an exceptionally high standard of wilderness "purity." Discussions about "purity" led to the idea of "enclaves" or small exclusions. Superintendent William Briggie explained the concept to a citizen of Bigfork in 1972. "When we refer to wilderness, we interpret this to be pure wilderness...If there is any encroachment into the wilderness, such as man-made structures, we are identifying it as an enclave and letting Congress and the people make the determination if they are willing to accept these in a pure wilderness setting in a national park."²⁴ In Glacier's first draft of a wilderness proposal, every patrol cabin, lookout, and chalet was surrounded by a ten-acre enclave.

Those who insisted on "purity" claimed to be taking the high road, but to most wilderness advocates their argument appeared to be mere obstructionism. As Briggie freely admitted, the enclave served other purposes besides protecting a high standard for wilderness. The enclave would allow park managers more latitude in what went on inside the enclave. For example, it would allow pit toilets and hitch racks to be periodically relocated to avoid irreparable resource damage. It would also allow use of chainsaws and other power equipment for making repairs to existing structures. Assistant Secretary of the Interior Nathaniel P. Reed saw that this logic was leading the Park Service to propose wilderness areas that were riddled with enclaves, which threatened to undermine the purpose. To prevent that from happening, Reed issued new administrative policies on classification and management of wilderness. Pursuant to those regulations,

²³ Miles, *Wilderness in National Parks*, 138-51.

²⁴ William J. Briggie to Richard W. Trembath, May 9, 1972, Folder 4, Box 221, GNP Administrative Records, GNP Archives.

Briggle received direction from Washington to eliminate most of the enclaves from the park's wilderness proposal.²⁵

In the wilderness proposal that the Park Service presented to the public in 1973, there were just four enclaves: two 25-acre enclaves surrounding the Sperry and Granite Park chalets, and two more 25-acre enclaves that would allow for construction of additional backcountry chalets at Cosley Lake and Debris Creek. In the hearings, the public opposed the idea of new chalets. As a result, the Park Service eliminated the latter two enclaves in the final proposal. Besides the two remaining enclaves for the Sperry and Granite Park chalets, major areas excluded from the final proposal included corridors along the Going-to-the-Sun Road, the Inside North Fork Road, and the Camas Road, as well as indentations in the wilderness boundary around the dead-end roads leading to Bowman Lake, Many Glacier, Two Medicine, Cut Bank Campground, and Kelly Camp at the head of Lake McDonald. Also omitted was the small triangle of area in the northeast corner of the park traversed by the Chief Mountain International Highway.²⁶ In the process of developing a wilderness proposal for Glacier, the public pushed the Park Service to include more area rather than less in the wilderness designation.

Glacier's wilderness plan had several important consequences for resource management. In the first place, it stopped new development in the park's wilderness zone. The wilderness plan ended discussion of building more backcountry chalets. Together with the designation in 1975 of the North Fork of the Flathead River as a wild and scenic river, the wilderness plan also ended consideration of a road link between the North Fork and Waterton Lakes through Akamina Pass. The wilderness plan solidified the North Fork's status as a quiet backwater relative to Glacier's other developed areas. That unofficial status benefited other resource values in turn. Most notably, the North Fork would acquire new significance when wolves returned to the area in the coming years.

A second consequence of Glacier's wilderness plan was to bring the concept of carrying capacity to the fore. The Park Service had begun applying the carrying capacity concept to recreation management as early as the 1950s. Sequoia National Park had announced that it would determine recreational carrying capacities for backcountry use in

²⁵ Director to Washington Office and Field Directorate, July 20, 1972, and Record of Telephone Conversation between Dan Davis and William J. Briggle, July 20, 1972, Folder 4, Box 221, GNP Administrative Records, GNP Archives.

²⁶ Glacier National Park, Midwest Region, National Park Service, Department of the Interior, *Final Environmental Statement, Proposed Wilderness Plan, Glacier National Park, Montana* (Washington: Department of the Interior, 1974), 35.

its landmark backcountry management plan of 1963.²⁷ Echoing that document, Glacier's environmental statement on its wilderness proposal included a declaration on carrying capacity which began, "To protect wilderness values, the human carrying capacity of the environment will be determined."²⁸ To that end, rangers began collecting data on backcountry campsites in 1971. The following year, the park imposed tentative carrying capacity limits for the number of people and livestock for individual designated campsites. Backcountry campers had to register and obtain camping permits.²⁹ This initiative marked the beginning of efforts to prevent deterioration of natural conditions around heavily impacted sites in the backcountry.

Another initiative involved much new handiwork, or what Superintendent Briggie called "backcountry cleanup." Just as park managers had traditionally devoted great efforts to keeping roadsides and developed areas tidy and aesthetic for the pleasure of visitors, henceforth those efforts would extend to trails and backcountry campsites as well. Sometimes those efforts involved more development, albeit of a primitive nature, as when sections of corduroy trail were built through boggy areas to reduce impacts on fragile terrain, or when foot bridges were installed over creeks to discourage hikers from trampling these areas in their search for an easier creek crossing. Sometimes "backcountry cleanup" involved removal of old trail shelters and patrol cabins that were thought to impair wilderness values. Sometimes existing trails or campsites were relocated or rearranged to reduce soil erosion or compaction.³⁰ To accomplish all of this work, Briggie pulled a handful of rangers out of the West Lakes and Hudson Bay districts and created a Continental Divide District under the charge of a backcountry coordinator. A few years later Superintendent Phillip Iversen abolished the Continental Divide District and placed those rangers back into the traditional line organization composed of two ranger districts. The backcountry coordinator became the wilderness specialist with oversight of all trail maintenance.³¹

With the advent of wilderness management the park succeeded in reducing human impacts in backcountry areas, especially in fragile alpine ecosystems. Park managers acknowledged that these improvements came at a cost as backcountry users now entered a more regimented environment. The greater attention to trail engineering and campsite

²⁷ "A Back Country Management Plan for Sequoia and Kings Canyon National Parks," in Dilsaver, ed., *America's National Parks: The Critical Documents*, 214-15.

²⁸ Glacier National Park, Midwest Region, National Park Service, Department of the Interior, *Final Environmental Statement, Proposed Wilderness Plan, Glacier National Park, Montana* (Washington: National Park Service, 1974), 20.

²⁹ Glacier National Park, *Annual Report, 1972*, typescript, pp. 5-6, copy provided by GNP Archives.

³⁰ Glacier National Park, *Annual Report, 1974*, typescript, pp. 8-10, copy provided by GNP Archives.

³¹ Glacier National Park, *Annual Report, 1975*, typescript, pp. 9-10, copy provided by GNP Archives.

layout also produced a somewhat more manicured wilderness in the national park compared to wilderness areas located, for example, on adjacent national forests. Park managers insisted that the permit system and other use restrictions were necessary because recreational use was more intensive in the park. Nevertheless, by the mid to late 1970s park managers began to ease up. The amount of wear and tear at backcountry sites declined as wilderness users abided by the new wilderness restrictions, acquired more lightweight camping gear, and adopted leave-no-trace camping ethics. In 1975, wilderness managers designated the remote Nyack and Coal Creek drainages as an experimental wilderness management zone where hikers were free to choose their own campsites within certain guidelines (a site had to be a minimum of 100 feet away from streams or lakes, out of sight of the trail or any other party, and away from meadows). No wood fires were allowed in this wilderness zone and hikers had to adhere to other low-impact camping techniques. Horse parties still had to use designated sites within this zone. When this experiment proved a success, the park permitted small parties to camp in undesignated campsites in other selected locations.³²

Horse use declined as the amount of backpacking increased. This was no coincidence; the two user groups were not entirely harmonious, and the growing popularity of backpacking in Glacier no doubt persuaded some horse users to seek recreational opportunities elsewhere such as in the nearby Bob Marshall Wilderness. After severe floods in 1975 destroyed a number of stock bridges in the backcountry, park staff made a thorough review of horse use and decided to replace those bridges with lighter, suspension-type bridges designed for foot traffic only.³³ By the latter part of the 1970s, most horse use in the park was limited to guided day trips starting from Many Glacier, Lake McDonald Lodge, and Apgar. As the older type of backcountry use yielded to the new, rangers recorded a noticeable change in the kinds of resource damage found in the backcountry – “From the predominant horse use impact of braided trails and stock-worn areas around popular backcountry fishing sites, to backpacker-oriented impacts, such as trail erosion from cutting switchbacks and overcrowding and pollution problems at focal points of travel and camping.”³⁴

As backpacking took hold in the 1960s, so too did two new forms of winter recreation: cross-country skiing and snowmobiling. A few snowmobiles appeared in

³² Glacier National Park, *Annual Report, 1975*, typescript, p. 10, copy provided by GNP Archives.

³³ Jack Potter, interview by Theodore Catton, October 20, 2009; Jack Potter, “Historical Reflections of Glacier: A 40-Year Personal Journey,” address at Glacier National Park’s Centennial Year Symposium, April 23-24, 2010, Kalispell, Montana.

³⁴ Glacier National Park, “Backcountry Management Plan for Glacier National Park,” 1979, Folder 4, Box 101, GNP Administrative Records, GNP Archives.

Glacier near the beginning of the decade. In 1967, the first year that snowmobile visitors were counted, they numbered 153. In 1970, they numbered nearly one thousand. Cross-country skiers were harder to count but park staff detected a growth in their numbers as well. During the winter season of 1972-73, a total of 877 visitors registered for cross-country skiing and snowshoeing trips into the park. Their numbers increased to nearly 3,000 two years later.³⁵

Even more than horse people and backpackers, snowmobile users and cross-country skiers clashed. The noise and fumes caused by snowmobiles offended the sensibilities of cross-country skiers, who were usually in search of a quiet, contemplative experience. Furthermore, snowmobiles obliterated the useful parallel tracks laid down in the snow by skiers. People who thought snowmobile use was inappropriate in a national park setting also pointed out that the machines were perfectly capable of going off-road (in violation of wilderness regulations), and that their loud two-stroke engines probably stressed wildlife at a time of year when most animals were struggling to survive.³⁶ People who took a benign view of snowmobiles, on the other hand, pointed out that the machines gave the winter visitor an opportunity to travel over unplowed park roads and enjoy spectacular winter scenery. In Glacier, snowmobiles were initially allowed access to nearly all park roads except the Going-to-the-Sun Road between Packers Roost and Jackson Glacier Overlook, a section that was closed due to avalanche hazard. Year by year, the park administration closed more of the Going-to-the-Sun Road to snowmobile use, in part to give non-motorized winter users sole access to that area of the park. It also required snowmobile operators to register at a ranger station upon entering the park. But despite those restrictions, Briggles assured *Hungry Horse News* publisher Mel Ruder that snowmobile users were still welcome in the park.³⁷

Public sentiment against recreational snowmobile use built during the early 1970s. President Nixon issued Executive Order 11644, which directed agency heads to develop regulations to govern off-road vehicle use on public lands. Senator Alan Bible (D-NV), chairman of the Subcommittee on Parks and Recreation, held a hearing on recreational snowmobile use. Still, the Park Service demurred from banning all snowmobile use in national parks, leaving to each superintendent the decision of how to handle the issue. To formalize that process, Regional Director Glen Bean directed all

³⁵ Glacier National Park, Rocky Mountain Region, National Park Service, Department of the Interior, *Environmental Assessment, Proposed Oversnow Vehicle Use at Glacier National Park, Montana* (Denver: National Park Service, 1975), 4-5.

³⁶ Malcolm F. Baldwin, "The Snowmobile & Environmental Quality," *Trends* 6, no. 2 (April 1970), 15-17.

³⁷ Mel Ruder, "Glacier Park Features Variety of Winter Fun," *The Missoulian*, November 7, 1970.

superintendents in the Rocky Mountain Region to prepare an EIS on snowmobile use in their parks.³⁸

Briggle's view was that Glacier's snowmobile policy ought to dovetail with Yellowstone's. In Yellowstone, Superintendent Jack Anderson supported snowmobile use by grooming the road between West Yellowstone and Old Faithful and accommodating winter visitors at Old Faithful. Briggle did not favor grooming park roads or providing winter accommodation, but as long as snowmobile users stayed on designated unplowed roads then they were not a problem to him.³⁹ Members of the park staff felt differently; in particular, they were concerned about the effects of snowmobiles on wildlife. When Phillip Iversen took over as superintendent in the summer of 1974, he found the park staff just getting started on the mandated EIS, and he gave them full scope to run with their concerns. Although the park lacked good scientific data, the EIS cited rangers' winter wildlife observations as anecdotal evidence that "the presence of both snowmobiles and humans appears to contribute to winter stress of wildlife species through behavioral responses." The EIS offered three alternative proposals for management, one of which was to prohibit all snowmobile use in the park.⁴⁰

The public hearings that followed from the EIS were controversial. The Flathead Snowmobile Association rallied support on one side while the Montana Wilderness Association stirred up interest on the other side. The park received 460 written comments and petitions that included the names of more than 1,500 individuals. Opinion was fairly evenly split with about 58 percent of persons being in favor of a ban. Iversen announced a ban on October 2, 1975. While wildlife concerns weighed in his decision, Iversen was most impressed by winter use trends, which showed increasing cross-country ski use and decreasing snowmobile use. The ban triggered an avalanche of angry letters over the winter, and at the request of Senator John Melcher (D-MT), Iversen held another round of public hearings the following May. Based on the public's response, he stuck with the ban. Later, he remembered the ban as the most controversial decision he made during his tenure at Glacier.⁴¹

A few years later, another controversy developed around scenic helicopter flights over the park. In 1981, James Kruger began offering helicopter flights to tourists. A

³⁸ Michael J. Yochim, "Snow Machines in the Gardens: The History of Snowmobiles in Glacier and Yellowstone National Parks," *Montana: The Magazine of Western History* 53, no. 3 (Autumn 2003), 4.

³⁹ Briggle interview.

⁴⁰ Glacier National Park, Rocky Mountain Region, National Park Service, Department of the Interior, *Environmental Assessment, Proposed Oversnow Vehicle Use at Glacier National Park, Montana* (Denver: National Park Service, 1975), 10.

⁴¹ Yochim, "Snow Machines in the Garden," 7; Phil Iversen, interview by Jennifer Bottomly, May 30, 2001.

second operator, David J. Hoerner, entered the business in 1988. Both operators were located in the West Glacier area and offered rides from mid June through early September. Park visitors complained that the helicopters were noisy and intrusive and occasionally harassed wildlife. Although the Park Service did not have authority to impose airspace restrictions, it stood behind a Federal Aviation Administration (FAA) advisory circular that called on aircraft not to fly less than 2,000 feet above ground level over the park. The park did have authority to protect wildlife from aerial harassment, and in 1987 the chief ranger began a file for case incident reports. Most such incidents recorded aircraft in violation of the 2,000-foot floor.⁴²

Park officials periodically met with the helicopter pilots and the FAA to recommend overflight routes that would minimize effects on both wildlife and visitors. The helicopter pilots cooperated to some degree. It was a difficult situation since the Park Service contracted with the helicopter pilots for other essential services and park officials did not care to roil those other business relationships. The pilots, for their part, wanted to placate park officials but also wanted to satisfy their clients. The economic demand for scenic overflights grew steadily during the first decade that the flights were offered and showed no sign of abating.⁴³

While scenic overflights were the nub of the issue, they were not all. David A. Smith of Earth First! objected to the use of helicopters by grizzly bear researchers. In Smith's view, counting grizzlies from a helicopter constituted wildlife harassment and violated wilderness values. Writing under the alias Dr. Arthur Dogmeat, he informed Superintendent Gilbert Lusk of his intention to conduct an aerial count of bald eagles gathered along McDonald Creek. "It is my understanding," he wrote with tongue in cheek, "that hundreds of tourists gather on the McDonald Creek Bridge to view the eagles. Would you please advise them to clear the bridge when they hear the helicopter approaching? We're going to be flying at tree-top levels, and the helicopter's roto-wash might push people off the bridge."⁴⁴ Environmental activist Doug Peacock also objected to the aerial counts of grizzlies in the Apgar Mountains and was unsatisfied by Cliff Martinka's explanation that researchers had only settled on use of helicopter counts after "intense consideration" of alternative monitoring techniques.⁴⁵

⁴² Dennis Divoky, "Low Flying Aircraft Report, Glacier National Park," March 1992, unprocessed central files, GNP Archives.

⁴³ Ibid.

⁴⁴ Dr. Arthur Dogmeat to Superintendent H. Gilbert Lusk, October 6, 1986, Folder 5, Box 11, GNP Central Files FY 1986, GNP Archives.

⁴⁵ Doug Peacock to Bob Burns and H. Gilbert Lusk, April 4, 1988, and Clifford J. Martinka to Peacock, December 23, 1987, File 4, Box 13 of 14, GNP Central Files FY 1988, GNP Archives.

Criticism of the amount of helicopter traffic came from within the park staff, too. Riley McClelland, who had returned to the park as avian ecologist, complained to the fire management officer that helicopter use had “gotten completely out of control.” Helicopters could be useful tools in rescue, medical emergency, and some fire events, McClelland wrote, but they were also “insidious assaults on the solitude of the park.” He recommended that the park only make use of helicopters for true emergencies. Excessive use not only impinged on the visitor experience, it made the Park Service’s job to control scenic flights difficult if not impossible.⁴⁶

In 1984, the U.S. Air Force proposed to make low-level flight tests over Glacier. The plan would have involved monthly flights of the giant B-52 bomber from west to east, each bomber passing directly over the Loop on the Going-to-the-Sun Road at 2,500 feet above ground level. The announcement caught the Park Service off guard and brought a slew of letters from dismayed citizens. “The sound of any aircraft flying over a national park can impair the experience being sought by visitors, especially those who love unimpaired ecosystems enough to venture into the back country,” wrote one citizen.⁴⁷ The bomber flights over Glacier were averted. Working with Senator Max Baucus (D-MT) and Representative Pat Williams (D-MT), the Park Service persuaded the Air Force to relocate the flight path elsewhere.



4.3 Logan Pass

Conflicts between preservation and visitor use were nowhere as stark and contentious as in the controversy over the boardwalk at Logan Pass. Some form of conflict became inevitable as soon as the Going-to-the-Sun Road was completed in 1933.

⁴⁶ Avian Ecologist to Fire Management Officer, May 4, 1990, unprocessed resource management files, GNP Archives.

⁴⁷ William R. Catton, Jr. to Superintendent, December 20, 1984, and Robert C. Haraden to Catton, December 28, 1984, Folder 7, Box 277, GNP Administrative Records 1910-1984, GNP Archives. The letter writer is the author’s father. See also Brian Kennedy, “Glacier skies may be bombers’ run,” *Hungry Horse News*, December 13, 1984, and Mark Brunson, “Williams plans to oppose Glacier bomber flights,” *Kalispell Daily Interlake*, December 15, 1984.

The question for management was how many visitors could be accommodated at Logan Pass without impairing the resource for present and future generations? At 6,664 feet above sea level, Logan Pass was (and remains) the premier scenic attraction of Glacier National Park, providing grand views of mountain peaks in an exquisite alpine meadow setting. Vegetation at that elevation grows slowly and is exceedingly fragile. Individual vascular plants that are trampled even by a single human footfall may not recover. Sample vegetation plots that were trampled just 15 times in 1967 still showed measurable effects 30 years later. As one researcher said, the conflict at Logan Pass is between “the photosynthetic and reproductive cycles of subalpine flora and the influx of several thousand visitors per day” – all of which happens around midday in the short span of days from early July to the end of August.⁴⁸

When the Going-to-the-Sun Road was opened, the only development at Logan Pass consisted of a small parking lot and limited restroom facilities. Over the next thirty years, total park visitation increased ten-fold, but the visitor load on Logan Pass was limited by the small amount of parking space available. In the mid 1960s, the Park Service built the Logan Pass Visitor Center, installed a new water and sewage system, and greatly expanded the parking area. The development occurred in the years before an environmental impact statement was required, and critics would later charge that it was done with an unfortunate lack of foresight and woefully little understanding of the ecological context. Predictably, visitor use of the Logan Pass area burgeoned. Three main problems quickly emerged, all related to the increased volume of people and the delicate vegetation: how to rehabilitate the construction site, how to dispose of sewage, and how to minimize damage to the meadow from trampling.⁴⁹

Park managers were displeased by the amount of scraped earth around the expanded development site. Their solution was to remove sod from a relatively inconspicuous area on the south edge of the parking lot and transplant it in front of the visitor center. According to James Habeck, a professor of botany at the University of Montana, more than an acre of meadow was ripped up for this purpose. “The success of the transplanting operation remains to be evaluated,” Habeck wrote bitterly in *National Parks & Conservation Magazine* some five years later, “but it is obvious that a high price was paid for this ‘beautification’ project.” An aerial photo accompanying his article

⁴⁸ Ernest Hartley, “Thirty-Year Monitoring of Subalpine Meadow Vegetation Following a 1967 Trampling Experiment at Logan Pass, Glacier National Park, Montana,” *USDA Forest Service Proceedings*, RMRS-P-15, vol. 5 (2000), 125.

⁴⁹ James R. Habeck, “Glacier’s Logan Pass: A Case of Mismanagement,” *National Parks & Conservation Magazine* 46, no. 5 (May 1972), 11.

showed several stripped sections still appearing completely barren two years after the sod was transplanted.⁵⁰

Park managers did no better with sewage disposal. As the volume of human waste at Logan Pass ballooned, the park addressed the problem by piping the liquid portion a short distance down the east side of the pass where it was discharged onto a spray field. After a few years it was apparent that this method of disposal was damaging the vegetation. Starting in 1971, the Logan Pass sewage was hauled by tanker truck to a new spray field located in porous ground near lower McDonald Creek. Although that took care of the sewage problem at Logan Pass, some people on the park staff worried that the nutrient-rich sewage would affect water quality and vegetation at the new disposal site.⁵¹

The biggest problem was with the increased volume of foot traffic. The Logan Pass area inspired people to ramble, and no amount of interpretation or signage could stop a certain fraction of visitors from striking out willy-nilly across the fragile sub-alpine meadow. For another lot, even the faintest path through the groundcover could serve as an invitation to go where others had already trampled. The problem was not confined to Logan Pass itself, but developed in areas along the Going-to-the-Sun Road on either side of the pass as well. The most heavily impacted area was the sub-alpine meadow one-half mile west of the pass. In 1982, resource management ranger William F. Conrod reported that heavy foot traffic had worn a “spiderweb of trails” into the meadow on both sides of the road. “The banks of Logan Creek are lined with a web of trails, apparently made by photographers, and stream lovers,” Conrod observed. “Below (north) of the road, trails lead through the sub-alpine firs to the brink of Oberlin Falls. The footing is uneven, but fortunately, is not slippery at the head of the falls.” Conrod noted that one park visitor had fallen over the cliff at this point in the 1970s. “In general,” he wrote, “we have a fragile ecosystem that is showing the result of visitor impact with no mitigating facilities, such as maintained trails, toilets, or signs.”⁵²

At Logan Pass, visitors could hike on a maintained trail to Hidden Lake Overlook. However, people would start hiking to the well-known overlook in June across lingering snow fields. As the snow melted out people would choose their own routes between or around snow patches. Chief of interpretation Edwin Rothfuss remembered that at a certain point in the early summer “you’d see all sorts of mud routes up to the overlook.”⁵³

⁵⁰ Habeck, “Glacier’s Logan Pass,” 11.

⁵¹ Ibid, 11-12; Riley McClelland, interview by Theodore Catton, October 20, 2009.

⁵² William F. Conrod, “Environmental Assessment, Logan Creek Sub-Alpine Meadow and Roadside,” February 1982, Folder 12, Box 233, GNP Administrative Records 1910-1984, GNP Archives.

⁵³ Edwin Rothfuss, interview by Theodore Catton, October 21, 2009.

It was the sort of muddy mess that Superintendent Briggie found intolerable. In 1970, he put four of his staff together in a committee and told them to find a solution. The park had \$35,000 and he wanted to spend it that summer. The committee included Rothfuss, McClelland, Martinka, and chief of maintenance Frank Elliott. Elliott proposed to build a boardwalk similar to boardwalks he had engineered for Yellowstone's geyser basins. McClelland thought the park should build a test strip of boardwalk and study it. The others thought they had enough information to build the whole thing and the need was pressing. Rothfuss took the committee's recommendation to Briggie and told him it was a three-to-one decision. Briggie had the committee prepare a finding of no significant impact (this was soon after the National Environmental Policy Act was enacted) so that construction could begin that summer.⁵⁴

As construction went forward on the boardwalk, other park staff had serious doubts about laying a 3,700-foot-long, eight-foot-wide structure in this landscape but they found no way to express their doubts to Briggie. In September 1971, a group of seasonal employees on the construction crew wrote a joint letter of protest and took it to the news media. Briggie terminated all of their employment contracts, which appeared to be a retaliatory action despite his claim that it was simply the end of the season. The Park Service assured each of the men that they would be hired back the next season. Meanwhile, the controversial dismissals fueled public skepticism about the project. James Habeck, the botany professor, condemned the boardwalk scheme and called for Briggie's ouster in a letter to *The Missoulian*.⁵⁵

The public's objections were primarily aesthetic. There was no disputing the fact that the boardwalk made a prominent sharp line across the park's most famous beauty spot. Before long, dismay over the aesthetics was joined by outrage over the environmental effects. The park's specifications for the lumber called for a treatment of the preservative pentachlorophenol. Although the preservative was aimed at protecting the wood against boring insects and rotting fungi, it was known to be toxic for higher forms of plant and animal life, too. It was most often used in agricultural and industrial construction projects in which the wood was buried in soil, but in this case the treated boards would sit above ground. These problems were compounded by the fact that the lumber supplier ignored the park's specification for a light treatment and instead gave the wood a double treatment. The new boardwalk not only leached chemicals into the soil, it

⁵⁴ Rothfuss interview; McClelland interview. According to McClelland, Martinka agreed with him that the park should first do a test strip. According to Rothfuss, the decision of the committee was three-to-one for approving the whole structure.

⁵⁵ Habeck, "Glacier's Logan Pass," 12; James Habeck, "Logan Pass Abuse is Severe," *The Missoulian*, October 9, 1971.

also emitted toxic fumes into the air, killing the needles on nearby sub-alpine firs.⁵⁶ (And from an aesthetic standpoint, the chemical treatment made the boardwalk stinky and slippery.) In the following summer, work crews tried to fix the problem by treating the wood to remove excess preservative. This half-measure did not suffice. Eventually, all of the chemically-treated lumber had to be removed and replaced with untreated lumber. (Even then, Briggie had trail crews put the treated lumber to use at various remote locations in the park rather than dispose of it.) Ironically, experience would show that untreated lumber held up quite well in the cold, dry conditions found at Logan Pass.⁵⁷

Over time, public dismay over the aesthetics of the raised boardwalk faded. If the boardwalk made an artificial and unsightly intrusion on the natural scene, that was the price of easy public access. To argue that the boardwalk was an abomination was really to object to the whole idea of the development of Logan Pass for mass public enjoyment – an idea that dated back at least to Mission 66 if not to the 1920s. Resource managers generally agreed that the boardwalk (once it was rebuilt with untreated lumber) proved to be the appropriate technology for the level of public use. There were no better alternatives. Reconstructing the trail with switchbacks would have been at least as conspicuous as the boardwalk and might have led to problems of short-cutting. Paving the trail with asphalt would have posed problems of drainage and would not have been as effective in keeping people on the path and protecting vegetation.



4.4 Bear Management

On the night of August 13, 1967, two 19-year-old women died in two separate grizzly bear attacks in Glacier. One attack occurred near Granite Park Chalet, the other at Trout Lake. Park staff who responded to the incidents during the night tried to make sense of the situation by imagining that the same incident was being reported twice, or

⁵⁶ R. Gary Beaver, “Logan Pass Wooden Walkway Study: Effects of Pentachlorophenol on Alpine Fir,” *Ecological Services Bulletin* 4 (1975), 1-5.

⁵⁷ Rothfuss interview; McClelland interview.

that a single bear was somehow involved in both attacks. Park staff still struggled to explain the coincidence when they prepared a 22-page report on the bear attacks some time later. Possibly the bears had been under physiological stress from extensive lightning storms in the preceding weeks. Both bears were evidently conditioned to feeding on garbage. The sow that attacked in Granite Park had been observed feeding with her two cubs at the garbage pit near the chalet; the old sow that invaded a backcountry camp at Trout Lake was found to have shards of glass stuck in her teeth.⁵⁸

The eerie coincidence and horrific details of the two bear attacks made a sensational story that suddenly vaulted the park's "bear problem" into the national limelight.⁵⁹ The twin incidents were reported in *Time Magazine* and other periodicals. True-crime writer Jack Olsen detailed the episode in a bestselling book, *The Night of the Grizzlies*. Not only did the two bear attacks raise concerns about visitor safety in bear country, they also brought more attention to the precarious fate of the grizzly. Eight years later, on September 1, 1975, the grizzly bear was listed as a threatened species in the lower 48 states under the Endangered Species Act. In that eight-year span from 1967 to 1975, a dramatic re-ordering of priorities took place in Glacier's resources management program. The problem of the elk herd and range conditions faded into the background as park managers confronted a new challenge: to determine whether humans and grizzly bears could co-exist in an area where the human population had come to exceed a million and a half visitors per year. Even today, resource managers look back on the pair of incidents in 1967 as one of the major turning points in the history of Glacier National Park.⁶⁰

Before 1967, there had never been a bear-caused human fatality in Glacier. Since grizzly bears stayed in the backcountry, and backcountry use was relatively light before the 1960s, human-grizzly interactions were historically rare. Black bears were not as reclusive as the grizzly and as a result some black bears foraged for garbage or begged for handouts from naïve park visitors, creating a "bear problem" in campgrounds and along roadsides. Prior to 1967, bear management in Glacier focused on control of these emboldened black bears. At that time, bear management in Glacier was no more critical than in several other national parks such as Yosemite and Great Smoky Mountains. In

⁵⁸ Glacier National Park, "Report: Grizzly Bear Attacks at Granite Park and Trout Lake in Glacier National Park, August 13, 1967," typescript, George C. Ruhle Library, GNP; Heidi Desch, "Night of the grizzlies – 40 years later," *Hungry Horse News*, August 9, 2007.

⁵⁹ Glacier National Park, "Report: Grizzly Bear Attacks at Granite Park and Trout Lake in Glacier National Park, August 13, 1967," typescript, George C. Ruhle Library, GNP. For a list of more than 50 people and organizations to whom the report was sent, see untitled memo in Folder 1, Box 247, GNP Administrative Records 1910-1984, GNP Archives.

⁶⁰ Kate Kendall, interview by Theodore Catton, October 19, 2009; Potter interview.

fact, the “bear problem” emerged in Yosemite in the 1920s, and in Great Smoky Mountains in the 1930s, but it did not become a significant concern in Glacier until the 1940s. Perhaps the black bears in each area responded to a certain threshold of visitor use, which Glacier attained at a later date than those other parks.

In 1950, Superintendent Emmert reported a noticeable decline in bear incidents over the preceding few years and attributed it to “aggressive” control measures. Emmert listed the park’s control measures as the following:

1. Roadside signs warning people not to feed bears.
2. Printed notices issued with each entrance permit explaining that bears are dangerous.
3. Press releases explaining the need for separation of people and bears.
4. Garbage removal from campgrounds, picnic areas, hotels, and residential areas.
5. Roadside garbage cans.
6. Live-trapping and removing to remote areas bears that were found in developed areas.

Emmert also reported fewer traffic jams resulting from bears being fed from cars than in former years, and attributed this change to better enforcement of regulations.⁶¹

Despite these control measures, however, Glacier continued to experience numerous black bear incidents. Incidents could involve property damage, human injury, or both. Each incident carried the risk of a tort claim against the Park Service. Furthermore, food-conditioned bears were in some sense unnatural. When visitors observed such bears seeking human food or garbage, the experience did not live up to the ideal of providing visitors an opportunity to view wildlife in a natural state. Neil J. Reid, the regional chief of wildlife management, spoke to these issues in 1963. “Food is the key to the bear problem,” he wrote, continuing:

Unfortunately, the problem is rooted as deeply in emotion as it is in objective reality. The presence of bears along the roadside and in campgrounds of the National Parks has become a tradition, and unquestionably seeing such bears is one of the major objectives of the park visitor. That the roadside bear is not living in a natural environment is immaterial to the average park visitor. But a search of the literature will reveal that park black bears have contributed relatively little to basic research. They constitute a park resource that has been

⁶¹ Superintendent to Regional Director, September 26, 1950, File 715-02, Box 68, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

so greatly altered that the basic ecology of the black bear is completely masked by bear-man relationships. It is difficult to say to what extent the Service has played in creating this situation. But certainly it has been condoned, and even labeled “an opportunity to see wildlife.” The difference of observing a bear in its natural environment and seeing one in a garbage can is so wide the above reasoning should never be offered as an excuse for inactivity in bear management. In discontinuing garbage dump bear talks over 20 years ago, the Service recognized that no matter how popular to people and bears the programs might be, their artificial nature was contrary to park philosophy and represented nothing more than low-grade entertainment. I am of the opinion the condition existing in the campgrounds and roadsides today differs from the garbage pit feeding programs only in a present lack of close supervision over the bears and people.⁶²

By 1963, bear-proof garbage cans were in use in many of Glacier’s campgrounds. Ironically, some campers would thoughtlessly leave refuse on the ground next to these containers when they could not fit the object through the narrow container door or when they found the container full. Use of the cans had to be accompanied by frequent garbage pickup or they were ineffective.⁶³ Garbage control was far from uniform throughout the park, however. One significant exception was the open garbage pit in Granite Park, which attracted grizzlies much to the delight of the chalet’s guests. The Park Service belatedly closed the dump following the fatal bear attack at Granite Park in 1967.⁶⁴

Next to minimizing opportunities for black bears to obtain human food or garbage, it was thought that the most effective strategy for controlling the “bear problem” was to remove problem bears. In Glacier, rangers allowed black bears just one “offense” before they were destroyed. The first time a bear was caught raiding garbage cans or begging for food along a roadside, it was live-trapped, taken to a remote area, marked with paint, and released. If a marked bear was caught a second time, it was removed and destroyed.⁶⁵

⁶² Regional Chief of Wildlife Management to Regional Chief of Ranger Services, July 8, 1963, Folder 4, Box 258, GNP Administrative Records 1910-1984, GNP Archives.

⁶³ Park Ranger to Chief Ranger, August 19, 1963, Folder 4, Box 258, GNP Administrative Records 1910-1984, GNP Archives.

⁶⁴ Kendall interview.

⁶⁵ Superintendent to Regional Director, December 14, 1964, File N16, Box 24, Numerical Subject Files 1949-65, RG 79, NA-RMR; Bear Management Plan, Glacier National Park, 1965, File N16, Box 36, Numerical Subject Files 1949-65, RG 79, NA-RMR.

The park administration acknowledged that it lacked data on black bear and grizzly bear ecology to evaluate whether destruction of problem bears was having an appreciable effect on the black bear and grizzly bear populations. Starting in the late 1940s, the park kept records on bears killed as a result of management. From 1949 to 1964, a total of 103 black bears and 15 grizzlies were eliminated. These numbers did not cause much concern at the time. Killing a grizzly would occasion more concern than killing a black bear, but incidents involving grizzlies were relatively rare.⁶⁶ Although the grizzly bear was listed as an endangered species under the Endangered Species Preservation Act of 1966, Glacier's bear management plan for that year stated, "Neither the black [n]or the grizzly bear is considered to be in need of assistance in order to survive within the Park." Bear management remained focused on minimizing the number of incidents involving personal injury or property damage by bears.⁶⁷ In the annual report for the year ending June 30, 1967, Superintendent Neilson reported a total of 36 black bears live-trapped and removed to remote areas and 9 black bears destroyed.⁶⁸

In the aftermath of the two grizzly bear attacks on the night of August 13, 1967, a total of four grizzly bears were destroyed. In addition, two cubs belonging to the sow grizzly implicated in the incident at Granite Park were orphaned. Such a heavy-handed response was consistent with existing management practice; however, it gave park managers qualms. Beginning in 1967, the park initiated research on the grizzly bear. The study objectives were to obtain quantitative data on the grizzly bear's habits, habitat relationships, movements, population dynamics, ecology, and management.⁶⁹ As public reaction to the sensational events of August 1967 gradually came to focus attention on the fate of the grizzly bear as an endangered species, the Park Service was forced to consider whether management-caused bear mortality might be placing the park's bear populations in jeopardy. A similar concern applied to black bears. That same summer, rangers launched an experiment to test whether twice-captured black bears might be deterred from returning to campground areas rather than being summarily destroyed. In this experiment, rangers live-trapped, tranquilized, and tagged 14 bears so that researchers could record each bear's movements relative to where it had been captured and where it

⁶⁶ Long Range Wildlife Management Plan for Glacier National Park, 1964, File N16, Box 24, Numerical Subject Files 1949-65, RG 79, NA-RMR. For an example of a report on the killing of a grizzly bear, see Superintendent to Regional Director, June 20, 1951, with enclosures, File 715-02, Box 68, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁶⁷ Bear Management Plan, Glacier National Park, 1966, typescript, George C. Ruhle Library, GNP.

⁶⁸ Glacier National Park, *Annual Report, 1967*, typescript, n.p., copy provided by GNP Archives.

⁶⁹ C. J. Martinka, "Grizzly Ecology Studies, Glacier National Park," July 15, 1969, typescript, George C. Ruhle Library, GNP.

had been released. Six of these bears were so-called “repeat offenders” that would normally have been eliminated after being recaptured.⁷⁰

The park’s internal reassessment of bear management policy was accompanied by a striking change in semantics. Before 1967, park rangers discussed bear management using the language of criminal law enforcement. Bears that sought human food or garbage were described as “nuisance bears,” “problem bears,” or “beggar bears,” while management actions involving live-trapping and removing a bear was considered “punishment” for the bear’s aberrant behavior. Reported bear incidents were referred to as “offenses” or “misdemeanors,” and in each case the bears were classified as “first offenders” or “repeat offenders.”⁷¹ Taking this anthropomorphism one step farther, Superintendent Libbey once referred to a class of bears that showed “decided anti-social tendencies.”⁷² After 1967, park rangers adopted the more neutral language of wildlife science and all of those pejorative terms rapidly dropped out of use. The change in semantics not only reflected the growing influence of scientists in resource management, it also reflected a fundamental shift in values in the Park Service, and indeed, in American society. According to the new values, if bears and humans could not co-exist in an area it was up to humans to make an adjustment. It was even possible that humans would have to limit their own use of an area to ensure the bears’ survival. It was precisely this shift in perspective that prompted Congress to pass a series of acts for the protection of endangered species, culminating in the Endangered Species Act of 1973.⁷³

Still, the park administration was eager to find that bears and humans could in fact co-exist if given the proper management. The two deaths in 1967 alerted park officials to the need for more management of backcountry use. Before this time, the park administration essentially did not regulate backcountry use other than to require all backcountry campers to obtain a campfire permit. But with backcountry use increasing, human/grizzly encounters had become more frequent. The park had to step up education for backcountry users so that users would be better prepared to avoid grizzly encounters. It also needed to develop a backcountry use permit system so that it could track use levels in the backcountry and enforce area closures. The park introduced other requirements for

⁷⁰ C. Robert Wasam, “Movement and Management of Marked Black Bears in Glacier National Park,” January 15, 1968, typescript, George C. Ruhle Library, GNP.

⁷¹ Superintendent to Regional Director, December 14, 1964, File N16, Box 24, Numerical Subject Files 1949-65, RG 79, NA-RMR.

⁷² Superintendent to Regional Director, May 13, 1943, File 715-02, Box 68, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

⁷³ For an excellent discussion of the shift in values in this period, see the chapter entitled “The Last Endangered Species,” in Stephen Fox, *The American Conservation Movement: John Muir and His Legacy* (Madison: University of Wisconsin Press, 1981).

backcountry use relating to disposal of human waste, protection of lakeshores, proper food storage, and other backcountry etiquette, all of which served the purposes of the Wilderness Act of 1964 as well as the Park Service's longstanding desire to provide a quality visitor experience, while the main impetus came from the events of August 1967 and centered on the park's need to regulate people in grizzly bear habitat.⁷⁴

Martinka made a field study of the grizzly bear from 1967 through 1971. His first concern was to learn about the grizzly population in Glacier: its approximate size, distribution, and trend. His annual population estimates varied from 175 to 230 grizzlies – considerably higher than previous estimates from 1923 to 1966, which varied from 90 to 130. Since Martinka's estimates were fairly similar from year to year, he reasoned that the population was at carrying capacity for the habitat. He hypothesized that social interaction between grizzlies caused sub-adults to disperse out of the area, which was a primary mechanism for maintaining the population at a fairly constant level. He found that grizzlies were distributed throughout the park at a mean density of about 12.2 animals per 100 square miles. The bears subsisted on a diverse diet of grasses, herbs, berries, roots, small mammals, and carrion. The distribution of grizzlies through the park varied in relation to fluctuations in the availability of its preferred foods.⁷⁵

Martinka's second concern was to evaluate the management program. Not surprisingly, he framed his study so as to test the hypothesis that increasing visitor use (especially backcountry use) was not putting the grizzly in jeopardy. Martinka began by tabulating human/bear encounters by year and classifying them into three categories – incidents resulting in personal injury, incidents resulting in property damage, and incidents involving a display of aggressive behavior. Then he looked for correlations between encounters, increasing numbers of visitors, and management actions (such as temporary trail closures). The results proved interesting. Total numbers of incidents showed an upward trend over the 1968-72 period, reaching a high of 12 incidents in 1972. Numbers of hikers on trails and backcountry campers increased as well. "Increased backcountry use obviously amplified the opportunity for contact between visitors and grizzlies," Martinka wrote.⁷⁶ But that was not the whole picture. Even as the number of incidents rose, Martinka found, the encounters were of a more benign character overall. There were no incidents involving personal injury after 1968 and no management actions resulting in the destruction of a grizzly after 1969. Over the five-

⁷⁴ Potter interview.

⁷⁵ Clifford J. Martinka, "Grizzly Ecology Studies, Glacier National Park," July 15, 1969, typescript, George C. Ruhle Library, GNP, p. 3; Martinka, "Preserving the Natural Status of Grizzlies in Glacier National Park," *Wildlife Society Bulletin* 2, no. 1 (Spring 1974), 13.

⁷⁶ Martinka, "Preserving the Natural Status of Grizzlies in Glacier National Park," 14.

year period the park had taken 28 actions to restrict visitor use of an area for the protection of grizzly bears. In 20 of these actions the temporary restriction was lifted after the bear or bears moved out of the area. In eight cases the grizzlies were removed to ensure visitor safety. All of these cases of removal involved grizzlies in or near developed areas. Three of the grizzlies that were removed were successfully relocated to another area using a helicopter. The other five bears were destroyed. The mean rate of grizzly mortality as a result of management actions in the period 1968-72 was comparable with the rate for the period 1946-70. Based on the trends for human injury and management-caused bear mortality, Martinka concluded that the management techniques were succeeding.⁷⁷ He told an audience of scientists and managers at the Third International Conference on Bears, "Progressive increases in park visitation through 1973 were accompanied by generally low encounter rates between bears and visitors."⁷⁸

On March 26, 1974, the Fish and Wildlife Service announced that it had received a petition from the Fund for Animals to review the status of the grizzly bear and consider its listing under the Endangered Species Act. The Fish and Wildlife Service requested the National Academy of Sciences to make a report with recommendations.⁷⁹ The outcome was not hard to predict; for many Americans the grizzly was already a veritable symbol of endangered wildlife. The impending listing raised interest in Glacier's population of grizzlies all over again. Assistant Secretary of the Interior Nathaniel Reed told the Park Service that he wanted to be advised immediately of any incidents involving grizzly bears in Glacier or Yellowstone. Associate Director John E. Cook passed this information to the regional director with instructions that he wanted to be telephoned personally at any hour of the day if and when an incident occurred.⁸⁰ Perhaps no other resource in the national park system received such close attention at so senior a level in the Park Service.

⁷⁷ Martinka, "Preserving the Natural Status of Grizzlies in Glacier National Park," 14-16.

⁷⁸ C. J. Martinka, "Ecological Role and Management of Grizzly Bears in Glacier National Park, Montana," reprinted from *Papers and Proceedings, Third International Conference on Bears – Their Biology and Management* (Morges, Switzerland: International Union for Conservation of Nature and Natural Resources, 1976), 152.

⁷⁹ Regional Director to Superintendent, April 30, 1974, enclosing copy of Fish and Wildlife Service, "Grizzly Bear Notice of Review of Status," in *Federal Register* 39, no. 62, March 29, 1974, Folder 6, Box 247, GNP Administrative Records 1910-1984, GNP Archives.

⁸⁰ Associate Director to Regional Director, May 10, 1974, Folder 6, Box 247, GNP Administrative Records 1910-1984, GNP Archives.



4.5 Toward Ecosystem Management

The grizzly was formally listed as a threatened species in the lower 48 states on September 1, 1975. To understand the far-reaching significance of the listing, it is helpful to consider some of the mechanics of the Endangered Species Act of 1973. The ESA still stands as one of the strongest environmental laws ever passed by Congress. Aimed at averting extinctions, it gave the federal government powers to protect listed species on all federal, state, tribal, and private lands where listed species were found. The law directed all federal agencies to develop conservation programs for threatened and endangered species and to ensure that land uses would not jeopardize the continued existence of such species or adversely modify or destroy critical habitat. Further, it required the Fish and Wildlife Service, working with partnering agencies, to establish a recovery plan for each listed species. Basic to each recovery effort (and to the ESA's extraordinary reach) was the concept of critical habitat. The Fish and Wildlife Service published its general definition of critical habitat in the *Federal Register* in April 1975. In essence, all critical habitat areas had to contain at least one habitat element that was critical to the survival of the species.⁸¹

When it came to designating critical habitat for the grizzly bear, officials realized that the existing definition of critical habitat was a poor fit for this animal. Research showed that the wide-ranging grizzly did not depend on any particular type of habitat; rather, it needed a wide expanse in which to disperse and still have separation from human development. The separation from humans was crucial because human-grizzly encounters so often resulted in death for the grizzly. The greatest threat to grizzly populations came from humans. Too many lethal encounters with humans pushed mortality rates to the point that the population could not sustain itself.

Since the grizzly bear required a large area of undeveloped lands for its survival, efforts to recover the species would involve an unprecedented level of interagency and federal-state cooperation. A first step in that direction was the formation in 1974 of the

⁸¹ Catton and Mighetto, *The Fish and Wildlife Job on the National Forests*, 193.

Interagency Grizzly Bear Study Team with Yellowstone biologist Dr. Richard Knight serving as team leader. As the study team began to consider how much land would be needed surrounding Yellowstone to ensure the survival of Yellowstone's grizzly bear population, the concept of a Greater Yellowstone Ecosystem was born. Soon an analogous conception developed for the area around Glacier. First it would be described as the Northern Continental Divide Ecosystem and later it would receive the more majestic name of Crown of the Continent Ecosystem.

All of the federal partners in the grizzly bear recovery effort moved slowly to designate critical habitat for the grizzly bear. Scientists and land managers debated how much space was required for each separate population of grizzlies. The debate turned on a related issue of some importance: how many individuals were required to constitute a "minimum viable population." The debate drew upon a growing body of work on island biogeography, which pointed to the importance of re-establishing links – or corridors, in spatial terms – between separate populations to maintain genetic diversity and to reduce the chances of any one population dying out. It was hard to reconcile this spatial model with the Fish and Wildlife Service's definition of critical habitat, which stipulated that all critical habitat areas had to contain at least one habitat element that was critical to the survival of the species.

After several years of scientific debate, public hearings, and negotiations between federal, state, and tribal officials, it became evident that all parties wanted a workable alternative to the critical habitat designation. The Shoshone National Forest in Wyoming, in cooperation with Yellowstone and the Fish and Wildlife Service, devised an alternative known as the Interagency Grizzly Bear Guidelines, which was adopted in the early 1980s by all agencies involved. The guidelines recognized five levels of grizzly habitat. These levels were called "Management Situations" (MS) 1 through 5. Areas containing the best or most important grizzly habitat, where existing populations were centered, were classified as MS-1. Areas that were considered devoid of grizzly habitat components were classified as MS-5. This unique habitat classification system was incorporated into a grizzly bear recovery plan, published by the Fish and Wildlife Service in 1982. The plan delineated six conservation areas (later renamed recovery zones) in Montana, Wyoming, Idaho, and Washington. Each recovery zone was composed of contiguous grizzly habitat that was classified as MS-1 through MS-3.⁸²

In the grizzly bear recovery plan Glacier became part of the Northern Continental Divide recovery zone or Northern Continental Divide Ecosystem (NCDE). The area took

⁸² Catton and Mighetto, *The Fish and Wildlife Job on the National Forests*, 193-94.

in all of the park together with a large swath of the Flathead and Lewis and Clark national forests. The NCDE contained the most robust population of grizzlies of any of the six recovery zones. The Greater Yellowstone Ecosystem had the second largest population of grizzlies but it was also the most geographically isolated of the six recovery zones. Three smaller populations in the North Cascades and Northern Rockies had the advantage that they connected with populations in Canada. One of the six zones, encompassing the Selway-Bitterroot Wilderness, actually contained no grizzlies but was suitable for grizzly reintroduction. A key component of the recovery plan was its set of management goals for each separate recovery zone. These included minimum numbers of females observed with cubs annually, limits on human-caused mortality both for the total bear population and specifically for females, and a spatial requirement that each population achieve distribution throughout the recovery zone.⁸³

The interagency effort to recover the grizzly bear drew Glacier officials directly into discussions about the larger ecosystem surrounding Glacier. Park scientist Martinka and Superintendent Phillip R. Iversen participated with officials from other agencies in defining habitat areas, management situations, and recovery parameters. At the same time, bear management at the park level was continuing to evolve. For the park, managing a population of grizzly bears in an area visited by so many people still constituted the heart of the matter. In 1976, another fatal mauling by a grizzly occurred, the first since 1967. Indeed, the year saw a spike in bear incidents overall. In addition to one fatality, three other grizzly incidents resulted in persons injured and fourteen grizzly incidents involved property damage. Two grizzlies were shot and one was live-trapped and removed from the park. One black bear was shot, another died from over tranquilizing, and two more were hit and killed by cars. Another 22 black bears were live-trapped and removed from the park. Superintendent Iversen stated in the annual report, "Bear incidents and injuries have become such a major and controversial issue that the park considers it an emergency situation and has requested emergency funding in the amount of \$119,500 in order to provide direct improvements to the bear management program in 1977."⁸⁴

Between 1975 and 1977, the park revamped its bear management plan. In contrast to earlier plans, which had as a primary objective to provide for visitor protection, the new plan began with a statement of two objectives. The first objective was to protect and maintain the status and natural habitat of grizzly and black bears in the

⁸³ Ibid, 194.

⁸⁴ Glacier National Park, *Annual Report, 1976*, typescript, pp. 11-12, copy provided by GNP Archives.

park. The second objective was to provide “maximum security and safety to the park visitor while recognizing the inherent dangers of a natural wilderness such as Glacier National Park.” Organizationally these two objectives represented parallel efforts, the first being assigned to the Resources Management Division and the second to the Visitor Protection Division.⁸⁵ Ideally the two objectives complemented one another: when people were protected from bears then bears were protected from people. But in practical terms a tension existed between these two sides of bear management as resource managers tried to get rangers to be more circumspect before killing dangerous bears.

Chuck Sigler, starting a long tenure as chief ranger in 1975, found himself in the middle of these disagreements. And the disagreements were not strictly internal. Whether people were injured or bears were killed, all such incidents had become a hot public issue. He measured his years, he later said, by “how the bears behaved.” In light of the grizzly’s new status as a threatened species, Glacier’s rangers did exercise more restraint in how they treated dangerous bears, but the change was not as fast or as pronounced as some people thought it should be. As Sigler noted, Glacier had a number of rangers who were experienced bear handlers. The park had more experience with handling bears than did the Fish and Wildlife Service, which sometimes called on Glacier to assist in live-trapping grizzlies located outside the park. Some of Glacier’s most experienced bear handlers had acquired their experience in Yellowstone in the 1960s, where the mindset had been to shoot bears that gave any trouble. The number of bears killed in management actions in Glacier would not show a significant decline until the 1980s.⁸⁶

Researchers and resource managers were also on a learning curve. One of their concerns was that higher levels of human activity in the backcountry would likely alter the grizzly’s natural behavior through a process called habituation. Would habituation make the bears more dangerous? In the late 1970s and early 1980s, grizzly researcher Katherine L. McArthur (later Jope) studied grizzly bear behavior in an effort to understand habituation. She began with the hypothesis that as grizzlies became habituated to humans they would become less apt to vacate preferred habitat when humans came near them, leading to more human-bear encounters. “If not addressed by management,” she wrote, “behavioral changes associated with habituation to people may

⁸⁵ Glacier National Park, “Bear Management Plan,” 1977, typescript, George C. Ruhle Library, GNP; Glacier National Park, “System Proposal for Application of Automatic Data Processing to Bear Reporting System in Glacier National Park,” March 31, 1977, File 3, Box 260, GNP Administrative Records 1910-1984, GNP Archives.

⁸⁶ Chuck Sigler, interview by Theodore Catton, October 22, 2009; Kendall interview.

compromise the long-term preservation of grizzly bears in national parks if they contribute to unacceptably high rates of bear/human conflicts.”⁸⁷

However, as McArthur continued her research over the next few years, she came to a different conclusion. Even though she found evidence of habituation among grizzlies, it was not leading to an increase in the rate of human injuries. “On the contrary,” she found, “habituation may contribute to a reduction in the rate of injuries that result from fear-induced aggression.” The reason, she believed, was that habituated bears maintained a degree of vigilance and would still avoid confrontation with humans when they were not surprised or directly challenged. McArthur’s findings led to efforts by park managers to make human activity in bear country more predictable and obvious to bears. Notably, hikers were encouraged to wear bear bells and avoid hiking off-trail or at night. The emphasis was on minimizing occurrence of surprise encounters.⁸⁸

A significant development in bear management in the late 1970s was the introduction of the Bear Information Management System (BIMS). All reliable bear sightings, incidents, and management actions were telephoned or radioed by park personnel to headquarters, assigned a case incident number, and inputted into a computerized database. The BIMS took the place of manual recordkeeping and led to a more consistent and comprehensive bear reporting system. Despite glitches in the early going, the computerized database proved to be a worthy management tool. Identical programs were put in use in other national parks at the same time. By 1979, it was in use in seven parks: Glacier, Yellowstone, Mount McKinley, Yosemite, Sequoia, Kings Canyon, Shenandoah, and Great Smoky Mountains.⁸⁹

With the help of BIMS, park staff developed another bear management tool, which they called the Bear Hazard Index System. Drawing on the enhanced availability of bear sightings and bear incidents data in BIMS, the latter system was used to warn subdistrict rangers of local areas where problems might be anticipated. If the Bear Hazard Index System indicated an “extreme” level of hazard for a particular area, the subdistrict ranger was authorized to take a preventive measure such as temporarily closing a trail. Park staff also touted the system as a tool for evaluating the effectiveness of management actions. For example, if rangers repeatedly live-trapped and removed

⁸⁷ Katherine L. McArthur, “Habituation of Grizzly Bears to People: A Hypothesis,” paper presented at the Fifth International Conference on Bear Research and Management, Madison, Wisconsin, February 10-13, 1980, George C. Ruhle Library, GNP.

⁸⁸ Katherine McArthur, *Interactions Between Grizzly Bears and Hikers in Glacier National Park, Montana*, Report 82-1 (Corvallis: Cooperative Park Studies Unit, Oregon State University, 1982), 1, 45-47.

⁸⁹ Jane E. Kapler to Roland Wauer, et al., July 5, 1979, Folder 9, Box 306, GNP Administrative Records 1910-1984, GNP Archives.

black bears from an area and the Bear Hazard Index System registered no appreciable change in the level of hazard for that area over time, then managers would have evidence that they needed to try another tack. The system was put into effect on an experimental basis in 1979.⁹⁰

Although managers felt encouraged by a general leveling off of the number of bear-caused personal injuries and management-related bear fatalities, the risk to visitor safety was always present and the long term outlook for bears remained uncertain. The fatal mauling in 1976 made managers especially wary. Unlike the earlier incidents, this one occurred in a developed area – the Many Glacier Campground. The park responded by restricting campground use to hard-sided trailers and camper vehicles only. After three years, the concession operator brought pressure on the superintendent to remove this restriction, but the superintendent refused, citing the fact that the Bear Hazard Index gave the Many Glacier area the highest bear hazard rating of any place in the park.⁹¹ The restriction on camping in the Many Glacier Campground remained in effect into the mid 1980s.



4.6 Kokanee Salmon and Bald Eagles

Although kokanee salmon are native to the Pacific Northwest, they are not native to the Flathead Basin. They were introduced into Flathead Lake about 1916 and probably into Lake McDonald in the early 1920s. The kokanee is not an anadromous fish like most salmon species; it spends most of its life cycle in freshwater lakes, spawning in tributary streams. Spawning kokanee were first documented in McDonald Creek below the outlet of Lake McDonald in 1935 and probably originated from downstream. The number of spawning kokanee in the lower section of McDonald Creek grew from year to

⁹⁰ Katherine L. McArthur, "The Bear Hazard Index System, Glacier National Park," April 1979, Folder 2, Box 260, GNP Administrative Records 1910-1984, GNP Archives.

⁹¹ Phillip R. Iversen to Don Hummel, August 9, 1979, Folder 8, Box 258, GNP Administrative Records 1910-1984, GNP Archives.

year, reaching an estimated 75,000 to 150,000 annually by the 1970s. Spawning occurred from October to January, with the peak in November.⁹²

Bald eagles began gathering along McDonald Creek during the kokanee spawning run probably in the 1930s. The annual wildlife report for 1939 recorded a total of 37 eagles seen in the park, which likely referred to a concentration of eagles stopping to feed on kokanee during the bird's fall migration since few active nests were recorded in the park at that time. A ranger's report for November 1947 described 20 eagles soaring over the outlet of Lake McDonald. Fall concentrations of bald eagles definitely grew during the 1950s, reaching a count of 352 in 1963.⁹³

Ranger Riley McClelland initiated an annual census of the bald eagles in 1965. The census consisted of making a weekly count by canoe along seven miles of McDonald Creek starting at the outlet of McDonald Lake. This method of counting gave more reliable results than previous efforts, which had been made on foot. After six years, the bald eagle census showed no apparent upward or downward trend in the total number of eagles but it did indicate a modest decline in the presence of immatures as a percentage of the population. McClelland noted that the continental count of bald eagles sponsored by the National Audubon Society from 1961 to 1963 had shown a similar decline in the percentage of immatures.

Believing strongly in the importance of this monitoring effort, McClelland was dismayed when Superintendent Briggie directed him to turn the annual census over to volunteers. Briggie did not think the seasonal concentration of bald eagles in the park was significant enough to warrant McClelland's personal attention and he actually forbade him from devoting further time on the job to it. This was the first of several disagreements over resource management that McClelland had with the new superintendent, and it appears to have been one factor in leading Briggie to abolish the position of resource management specialist in September 1971. Briggie had already abolished the position of aquatic biologist the previous year.⁹⁴

McClelland was able to recruit a University of Montana graduate student, David S. Shea, to continue the weekly census by canoe during the kokanee runs in 1971 and 1972. Park staff continued making counts after 1972 although the latter counts did not follow the rigorous protocols that McClelland had established in the previous decade. In 1977, more personnel participated in the count, which contributed to a record high count

⁹² B. Riley McClelland, "Autumn Concentrations of Bald Eagles in Glacier National Park," *The Condor* 75, no. 1 (Spring 1973), 121.

⁹³ McClelland, "Autumn Concentrations of Bald Eagles in Glacier National Park," 121.

⁹⁴ Riley McClelland, personal communication with author, undated.

of 444 birds. In 1981, the eagle concentration reached an all-time high of 639 birds. Variations in the percentage of immatures probably related to the fact that immature bald eagles tended to move south earlier in the fall than adult bald eagles; therefore, if maximum counts occurred earlier then the percentage of immatures was higher.⁹⁵

The bald eagle concentrations created a new visitor attraction. It took two decades for large numbers of eagles to find the kokanee run, but it only took half as long for large numbers of people to find the bald eagles and the new spectacular wildlife viewing opportunity along McDonald Creek. Before 1970, few people knew about the phenomenon. In 1971, the park installed a small observation blind for researchers at an oxbow bend about one quarter mile south of the Apgar Bridge where eagles gathered in especially large numbers. Since visitors were still rare at this time, they were allowed access to the blind. Within a few years, as more people went to Glacier in the fall months to see the bald eagles, public use of the blind became a problem. The blind was obviously located in a sensitive area. As many visitors failed to be quiet or stay concealed, they unintentionally disturbed some of the eagles away from their preferred feeding area. The park tried issuing permits to those visitors who wanted to walk from Apgar Bridge to the blind, but these problems persisted.⁹⁶

The two other popular vantage points for viewing the eagles were Apgar Bridge and Quarter Circle Bridge. Since both sites could be accessed by car but had little in the way of parking space, they became noisy and congested during periods of peak use. Some visitors, wanting to escape the crowded conditions found at the bridges, disregarded signs and entered closed areas on foot.⁹⁷

On February 14, 1978, the bald eagle was listed as an endangered species under the ESA. The listing added urgency to the park's efforts to develop a bald eagle management plan. Park staff completed a plan already in progress two months later, got it approved, and implemented it in the fall. Park staff routed all birdwatchers through the Apgar Campground, required them to park their vehicles at the Apgar Visitor Center, and invited them to hike the short distance to the Apgar Bridge. Alternatively, birdwatchers could park in a designated area and walk one-half mile to the Quarter Circle Bridge

⁹⁵ David S. Shea, "Bald Eagle Concentrations in Glacier National Park," *Western Birds* 9 (1978), 35-36; Riley McClelland and Pat McClelland, "Bald Eagles and Kokanee Salmon: A Rendezvous in Glacier National Park," *Western Wildlands* 11, no. 4 (Winter 1986), 7. See also B. Riley McClelland, Leonard S. Young, David S. Shea, Patricia T. McClelland, Harriet L. Allen, and Elizebeth B. Spettigue, "The Bald Eagle Concentration in Glacier National Park, Montana: Origin, Growth, and Variation in Numbers," *The Living Bird* 19 (1981); reprint, Cornell: Cornell Laboratory of Ornithology, 1982.

⁹⁶ Glacier National Park, "Bald Eagle Management Plan," March 13, 1978, George C. Ruhle Library, GNP.

⁹⁷ Glacier National Park, "Bald Eagle Management Plan," March 13, 1978, George C. Ruhle Library, GNP.

viewing area. Park staff also improved signage to keep people from entering the closed area.⁹⁸

The bald eagle concentration raised philosophical as well as practical issues for resource managers. Since the kokanee were non-native, some people argued, the bald eagle concentration at McDonald Creek was in one sense unnatural. If the Park Service were to follow the advice of the Leopold Report literally, then it would have to conclude that the bald eagle concentration probably did not occur at the time that Euro-Americans entered the ecosystem and therefore it was extraneous to the goal of making Glacier National Park into a vignette of primitive America. On the other hand, the Park Service wanted to support the nation's effort to recover the bald eagle from the brink of extinction. A revised eagle management plan in 1982 left no doubt about where the park stood concerning this paradox. Acknowledging that the kokanee's presence in park waters was "inconsistent with national park objectives of naturalness," the plan pointed out that nonetheless this food source for eagles probably offset other feeding opportunities that had been lost outside of Glacier by the construction of dams and other development. The concentration of bald eagles on McDonald Creek was unnatural only in terms of location. "Bald eagles must be viewed as components of continental biota and management should focus on long term preservation of this migrating species," the plan declared unequivocally.⁹⁹

The kokanee salmon populations in Lake McDonald and McDonald Creek crashed just a few years later. Scientists connected the crash to the introduction of *Mysis* shrimp in Flathead Lake. The shrimp were supposed to provide food for the kokanee but it appears that other predator fish populations reaped the benefit and then preyed on young kokanee. While the decline of kokanee was a welcome development from the standpoint of the park's desire to restore a thriving native bull trout population in Lake McDonald, it led to the displacement of the bald eagles. The yearly count of bald eagles on McDonald Creek declined steeply from 1985 to 1987 and diminished to 25 in 1989.¹⁰⁰ The park abruptly changed its focus from managing habitat and visitor intrusions at the former bald eagle concentration area to protecting the handful of bald eagle nests and roosts found within the park.

A nesting pair of bald eagles at the upper end of Lake McDonald received particular care. The nest was just one of three active bald eagle nests in the park in 1982.

⁹⁸ Glacier National Park, *Annual Report, 1979*, typescript, p. 7, copy provided by GNP Archives.

⁹⁹ Glacier National Park, "Revised Eagle Management Plan," 1982, George C. Ruhle Library, GNP.

¹⁰⁰ Craig N. Spencer, B. Riley McClelland, and Jack A. Stanford, "Shrimp Stocking, Salmon Collapse, and Eagle Displacement," *BioScience* 41, no. 1 (January 1991), 17.

After recording several years of low productivity (one eaglet fledged over a span of five years), the park implemented several measures to keep disturbances to a minimum. These included closure of the upper end of the lake to boats for two months in the spring, closure of Upper McDonald Creek inlet to fishing for nearly the same period, and various efforts to reduce noise coming from Lake McDonald Lodge, the summer cabins, and snow plowing operations on the Going-to-the-Sun Road.¹⁰¹ A proposal to develop new housing units for Lake McDonald employees was called into question when it was found that the placement of these units in the Snyder Creek floodplain could disturb a bald eagle roosting site. After convening a workshop of outside experts, the park scuttled the development concept plan and started over.¹⁰²



4.7 Changing Fire Policy

From the release of the Leopold Report in 1963 until the Yellowstone fires of 1988 and beyond, Glacier's fire policy was in transition. Changes in theory came much more quickly than changes in management on the ground. Resource managers understood the theoretical importance of restoring natural fire to the ecosystem long before they were willing to take the necessary risks to make it happen. Since the park now had an effective fire suppression capability that it had built up over decades, the decision to allow a natural fire to run its course, or the decision to steer it in a certain direction, carried an awesome responsibility. A managed fire always held the risk of getting out of control and destroying life and property. Although the Leopold Report initiated the process of rethinking fire management in Glacier, it took another thirty years of fire ecology research to convince managers that the risk of using fire as a management tool was both acceptable and necessary.

¹⁰¹ Vegetation Specialist to Assistant Superintendent, March 14, 1988, File 9, Box 13 of 14, GNP Central Files FY 1988, GNP Archives.

¹⁰² Lynn A. Maguire, "Final Report on Glacier Eagle Workshop," July 6, 1989, Accession 13402, Glacier National Park Archives.

While park managers acknowledged the Leopold Report's message that natural fire must be allowed to occur, it was not until the Park Service published *Administrative Policies for Natural Areas* in 1968 that restoration of natural fire became a universal objective. The new guidelines stated, "The presence or absence of natural fire within a given habitat is recognized as one of the ecological factors contributing to the perpetuation of plants and animals native to that habitat." It went on to define two types of managed fire. In the first instance, managers could allow a naturally occurring fire to run its course "within predetermined fire management units" where managers believed it would have beneficial effects for vegetation and wildlife. These became known as "prescribed natural fires." In the second instance, managers could ignite fires to achieve the same objectives as a substitute for natural fire. The latter were called management-ignited prescribed fires (MIPF) or simply "prescribed fires."¹⁰³

At the time that restoration of natural fire became part of service-wide policy, some parks embraced the concept while others resisted it. In Yosemite and Sequoia, research scientists were eager to experiment with prescribed burns, and in Everglades resource managers had already been doing so for more than a decade.¹⁰⁴ In Glacier, neither Superintendent Neilson nor Superintendent Briggie had much enthusiasm for it. It would take longer for Glacier to abandon its traditional commitment to total fire suppression. Glacier's conservatism on this resource management issue stemmed from two main factors. First, it was a big fire park with a history of massive conflagrations, so the risks were great. Second, it did not have conspicuous fire-dependent natural resources – such as sequoias or everglades – that were under obvious threat from fire suppression. Indeed, forty years after the Leopold Report was written, fire history experts would still debate whether long-term fire exclusion had really made much difference in Glacier's forest ecology.¹⁰⁵

One of the first people to assert that total fire suppression was altering natural conditions in Glacier was University of Montana botany professor James Habeck. Habeck studied forest succession in the cedar-hemlock forests located around Lake McDonald. Cedar and hemlock represented the final stage in the succession from pioneer to seral to climax species following a disturbance such as fire. Habeck's research showed that forest succession did not occur uniformly, but varied according to differences in elevation, microclimate, slope drainage and exposure. The forests around Lake

¹⁰³ Quoted in Dilsaver, ed., *America's National Park System: The Critical Documents*, 355.

¹⁰⁴ Bruce M. Kilgore, "Restoring FIRE to National Park Wilderness," *American Forests* (March 1975), 16-17, 57.

¹⁰⁵ Stephen W. Barrett to Fred VanHorn, April 16, 2003, unprocessed RM files, GNP Archives.

McDonald, though they varied in age and composition, all showed evidence of fire disturbance. Habeck's work showed that even in the relatively humid zones on the west side of Glacier the natural ecosystem was shaped by fire.¹⁰⁶

The next two individuals to bring attention to fire ecology in Glacier were Ranger William Colony and a Cornell University graduate student, Steve Kessell. Colony was Glacier's fire control officer. Colony thought that the key to implementing prescribed fire was to equip fire managers with information that would readily predict fire behavior in any given location and set of weather conditions. Since fire responded to a wide array of variables – fuel type, slope, wind speed, wind direction, air temperature – Colony thought it might be possible to use a computer to do the necessary real-time computing and give fire managers what they needed. In 1972, Colony found an ally in Kessell, who had just arrived in the park to do field research for his dissertation in ecology. With Colony's encouragement, Kessell dropped what he had planned to do and took up fire ecology.¹⁰⁷

Kessell ran with Colony's computer modeling idea. He obtained a grant from the National Science Foundation and launched into what would be a three-year research project. Kessell's aim was to develop a computer-based fire management module. His first step was to superimpose a 100-meter grid over all of the park's forested area and input forest types, fuel accumulation, and angle and direction of slope for every grid coordinate. His next step was to develop fire behavior predictions for every coordinate that were responsive to ephemeral conditions such as weather, wind direction, time of day, and previous burn data. The result – and this was Colony's original inspiration – would be a tool that fire managers could use to predict a fire's behavior as soon as it was reported. In theory, whenever a fire started in a natural prescribed burn unit, managers would be able to decide immediately whether current conditions called for suppressing, containing, or simply monitoring the fire.¹⁰⁸

Kessell described his approach as gradient modeling because it was based on gradient analysis of the vegetative cover. "Rather than dealing with the landscape and its

¹⁰⁶ James R. Habeck, "Forest Succession in the Glacier Park Cedar-Hemlock Forests," *Ecology* 49, no. 5 (Summer 1968), 873-74; "Kessell Blasts Park Fire Policy," *Hungry Horse News*, November 11, 1976. Also see James R. Habeck, *Fire Ecology Investigations in Glacier National Park: Historical Considerations and Current Observations* (Missoula, Montana: University of Montana, Department of Botany, 1970).

¹⁰⁷ William M. Colony, interview by Jennifer Bottomly, January 25, 2002.

¹⁰⁸ Stephen R. Kessell, "The Preliminary of a Computer-Based Fire Management Program for Glacier National Park," September 8, 1972, George C. Ruhle Library, GNP; Stephen R. Kessell, "Gradient Modeling: A New Approach to Fire Modeling and Wilderness Resource Management," *Environmental Management* 1, no. 1 (1976): 39-48.

vegetation as sharp, discontinuous units, gradient analysis describes and quantifies continuous variation in the landscape and its biota,” he wrote.¹⁰⁹ It meshed with Habeck’s own gradient analysis of cedar and hemlock forests around Lake McDonald and seemed to offer a vast refinement over previous forest-type mapping done in the 1930s.

In 1974, Kessell and Colony had made sufficient progress on the module to impress Superintendent Briggie, who instructed the fire control officer to prepare a revised operational policy statement for the park. Briggie wanted to nudge the park in the direction of using fire as a management tool without immediately committing the park to that next step. Accordingly, the park’s operational policy for fire management was rewritten to allow for “fire management zones.” These were not natural fire prescriptions, but rather areas in which “specified management action” would be taken “upon approval by a Fire Management Review Team.” At this early stage, zone boundaries would be dynamic and subject to modification as fire ecology became better understood.¹¹⁰

The gradient fire model made its debut in the summer of 1975. Unfortunately, it was a summer of small, low-intensity fires. Only one, the Redhorn Fire, provided an opportunity to test the model’s predictions against actual fire behavior. Although the predictions were close, the fire intensity was so low that managers did not feel it was a good test.¹¹¹ After yet another summer passed in which the park made no effective use of the gradient fire model, Kessell grew impatient and took his work-in-progress to the Forest Service in southern California.¹¹²

Even without the module, Colony remained intent on adapting the park’s fire management policy. Three prescribed burns were planned for 1979. Each one required extensive preparation culminating with a preburn report. All three prescribed burns were cancelled because weather conditions were not ideal.¹¹³ Similar planning and cancellations occurred over the next three years. Each burn was to be experimental and small-scale – no more than five to ten acres. Colony described the objectives for one burn as “habitat manipulation and restoration of fuel loading to natural conditions,” and

¹⁰⁹ Kessell, “Gradient Modeling: A New Approach to Fire Modeling and Wilderness Resource Management,” 41.

¹¹⁰ “Section 233. Operational Policy for Fire Management and Control in Glacier National Park,” undated, Folder 8, Box 306, GNP Administrative Records 1910-1984, GNP Archives.

¹¹¹ Glacier National Park, *Annual Report, 1975*, typescript, p. 12, copy provided by GNP Archives.

¹¹² “Kessell Blasts Park Fire Policy,” *Hungry Horse News*, November 11, 1976.

¹¹³ Robert L. Hall, “Resources Management Activities,” March 31, 1980, Folder 7, Box 257, GNP Administrative Records 1910-1984, GNP Archives.

“experience in handling fire in beetle killed lodgepole.”¹¹⁴ In another case, the objectives were to “prolong the presence of Ponderosa pine forest type by burning the understory to kill invading seedlings and saplings of Douglass-fir and Lodgepole pine, and to prepare favorable seed germinating conditions for Ponderosa pine,” as well as to acquire a first example of the prescribed fire technique in Glacier.¹¹⁵ The latter objective was proving more elusive with each passing year.

James Habeck, together with Dr. Bob Steele from the University of Montana’s School of Forestry, got involved with Glacier’s sputtering prescribed fire program with the help of a \$50,000 grant from the Man and the Biosphere Program. When Habeck and Steele found their prescribed burn suddenly cancelled because rangers who were supposed to be on hand were called away to live-trap a sow grizzly and cubs, they too pulled out in frustration. Habeck wrote an angry letter to acting superintendent Joe Shellenberger. “If either you or the new superintendent are interested in our continuing with this fire management project, some new ground rules have to be implemented,” Habeck insisted. “I need convincing proof the park wants us to stay with this project.”¹¹⁶ When Habeck did not get the assurance he wanted, he took his research efforts to the Bitterroot-Selway Wilderness where he found better cooperation from the Forest Service.¹¹⁷

Dr. Ron Wakimoto, a professor of forestry at the University of Montana, stepped in when Habeck left, and he stayed with the park’s fire research program through the following decade. Wakimoto was joined by Dr. Bruce Kilgore, a leading proponent of prescribed fire in Sequoia in the 1970s, then on assignment as project leader for the Northern Forest Fire Laboratory in Missoula. In 1981, Glacier carried out its first prescribed fire, the five-acre Sullivan Burn. The following year, Wakimoto and Kilgore selected a site near the Logging Creek Ranger Station for another experimental burn, this one to cover 80 acres. In a press announcement about the planned burn, Superintendent Robert C. Haraden cited recent advances in ecology and fire management as providing a new foundation for the park’s efforts to restore natural fire to the ecosystem. In August

¹¹⁴ William M. Colony, “Preburn Report, Glacier National Park, Bowman Burn, Management Burn Number 4,” July 19, 1979, Folder 7, Box 284, GNP Administrative Records 1910-1984, GNP Archives.

¹¹⁵ William M. Colony, “Preburn Report, Glacier National Park, Sullivan Burn, Management Burn Number 3,” September 20, 1980, Folder 10, Box 306, GNP Administrative Records 1910-1984, GNP Archives.

¹¹⁶ James Habeck to Mr. Shellenberger, December 8, 1980, Folder 11, Box 306, GNP Administrative Records 1910-1984, GNP Archives.

¹¹⁷ Habeck interview.

1982, Regional Director Lorraine Mintzmyer visited the site.¹¹⁸ After the fanfare, this prescribed burn, too, was cancelled when conditions did not appear favorable. But it was carried out successfully the next year on August 31 and September 1, 1983.¹¹⁹

Despite that signal breakthrough, the park's fire management program continued to put heavy emphasis on suppression of wildfire. The gap between theory and practice was noted as early as 1977, when the park completed a mammoth environmental assessment on its forest fire management program. The first chapter of the assessment provided an overall description of the problem and concluded with the following statement:

Fire suppression, increasingly effective in Glacier National Park since 1910, has altered the land noticeably in some areas. Development of a tall understory in pine stands, lack of aspen reproduction in some areas, increase in old-age lodgepole pine, invasion of meadows by conifers and maturation of range for some ungulates, all evidence a trend toward homogeneity in landscape and reduction of some species from their natural distribution. It is becoming evident that the traditional practice of total fire suppression has not been in keeping with the purposes of Glacier National Park.¹²⁰

Later in the report there appeared the blunt statement, "Glacier National Park is at this time, contrary to policy statements, still committed in practice to total fire suppression."¹²¹ No one disputed that point. In 1983, when Gary Gregory transferred from the regional office to Glacier and headed up an effort to produce a new resource management plan, he aimed to narrow that gap between theory and practice. A former forester in the Bureau of Indian Affairs, he had worked on the White Mountain Apache and San Carlos reservations in Arizona in the 1970s where prescribed burning was used more aggressively than any other place in the nation. Gregory had participated in numerous interagency discussions about returning fire to the landscape – whether it was

¹¹⁸ Glacier National Park, "Research Fire Planned in Glacier National Park This Fall," and "Regional Director Inspects Proposed Site for Research Fire," undated news releases, Folder 12, Box 310, GNP Administrative Records 1910-1984, GNP Archives.

¹¹⁹ Glacier National Park, *Annual Report, 1983*, typescript, pp. 15-16, copy provided by GNP Archives.

¹²⁰ Glacier National Park, Rocky Mountain Region, National Park Service, Department of the Interior, *Draft Environmental Assessment, Forest Fire Management, Glacier National Park* (West Glacier, Montana: National Park Service, 1976), Section 112.

¹²¹ Glacier National Park, Rocky Mountain Region, National Park Service, Department of the Interior, *Draft Environmental Assessment, Forest Fire Management, Glacier National Park* (West Glacier, Montana: National Park Service, 1976), Section 130.

for purposes of protecting a timber crop (as on the Arizona reservations) or preserving wilderness values. He viewed the change in fire management as “a very important part of returning Glacier to a naturally functioning ecosystem.”¹²²

Glacier produced a revised fire management plan in 1984, its first in seven years. Fire researchers contributed to the plan as well as numerous Forest Service fire management personnel. It offered natural fire prescriptions based on location, time of year, and energy release component, and it called for flexible response to natural fire involving a mix of containment, confinement, and control. Still, the authors of the plan recognized that it was a relatively conservative plan as it took into account the difficulties of managing fire in Glacier. Aware that theory and practice were still wide apart, the authors made the modest claim that the plan “begins the process of returning fire to its natural, and critical role in the Glacier ecosystem.”¹²³

If Glacier’s managers were reluctant to authorize prescribed burns, they were even more wary of prescribed natural fire. Although allowing a lightning-ignited fire to burn might seem to involve less liability than intentionally igniting a fire, the prescribed natural fire often carried more risk of getting out of control. Indeed, the main point of fire prediction models was to give managers more confidence that a natural fire would not get out of control. But managers first had to gain confidence in the model. Kessell’s model was among the earliest computerized fire prediction models put to use anywhere. After Kessell left the park, models continued to improve and gain wider distribution. In 1987, the park acquired a new fire prediction model called BEHAVE. Others would follow, each one purporting to be an improvement on the last.¹²⁴ In the meantime, Glacier’s fire organization continually planned for prescribed natural fires but almost invariably fell short in the execution. Fire suppression was always the safer call.

There was one notable exception. In late August 1984, the Crystal Fire began on the Flathead National Forest, crossed the Middle Fork of the Flathead River, and entered the Coal Creek drainage. This area of the park did not lie within a fire management zone because the park did not want a prescribed natural fire to jump the river and burn into the national forest. However, since the fire spread into the park from the national forest that concern became moot. The Crystal Fire was not lightning-caused, either. It was ignited by a power line. Putting that issue aside as well, park managers decided that the fire would be beneficial. Firefighters built control lines on the east and west but allowed the

¹²² Gary Gregory, interview by Theodore Catton, October 21, 2009.

¹²³ Superintendent to Regional Director, January 7, 1985, Folder 11, Box 18, GNP Central Files FY 1985, GNP Archives.

¹²⁴ Glacier National Park, *Annual Report, 1986*, typescript, n.p., copy provided by GNP Archives; Dennis Divoky, interview by Theodore Catton, October 19, 2009.

fire to run north up Coal Creek drainage until it burned out. This improvised prescription and partial containment was considered to be a shining success. At approximately 4,000 acres, the fire probably burned only a little more area than it otherwise would have if the park had opted to suppress it. “The decision to confine the fire resulted in great environmental benefit and a project cost saving of over two million dollars,” the superintendent stated in his annual report.¹²⁵

The risks involved in prescribed natural fire were demonstrated to the world when numerous fires burned out of control in Yellowstone in 1988. Ever since the early 1970s, park managers had tried in vain to correct the public perception that the Park Service’s fire policy was a “let burn policy” – a misnomer that carried negative connotations of passivity or even indifference. In the aftermath of the Yellowstone conflagration, this misperception came home to roost. Even such a well-informed politician as Senator Max Baucus (D-MT), pandering to the public’s misplaced anger, referred to “uninsured losses from ‘let burn’ fires” in a speech on the Senate floor.¹²⁶ In the charged political atmosphere surrounding the Yellowstone fires, the Park Service placed a moratorium on prescribed natural fires, put tight restrictions on prescribed burning, and called for new fire management plans for each natural-area unit in the national park system.¹²⁷

The same year that Yellowstone burned, Glacier experienced its biggest forest fire in decades. The Red Bench Fire started on the Flathead National Forest and jumped the North Fork into the park. While the political fallout from the Yellowstone fires was still in the offing, the public reaction to that conflagration was already evident and as a result Glacier’s superintendent had no appetite for responding to the Red Bench Fire in any way other than all-out suppression. For a few frightening days in early September the Red Bench Fire raged nearly out of control and an evacuation plan for headquarters was almost put into effect. Then it rained and the fire was quickly suppressed. The Red Bench Fire burned approximately 32,400 acres altogether, including some 22,200 acres inside the park.¹²⁸

Both the public’s consternation over the Yellowstone fires and the scary experience of the Red Bench Fire threatened to put the brakes on Glacier’s already halting efforts to develop prescribed natural fire as a management tool. In the aftermath of the Yellowstone fires of 1988, many units of the national park system produced new fire management plans that took a step backward in the direction of all-out fire

¹²⁵ Glacier National Park, *Annual Report, 1984*, typescript, pp. 14-15, copy provided by GNP Archives.

¹²⁶ U.S. Congress, *Congressional Record – Senate*, September 23, 1988, pp. S13196-97.

¹²⁷ Acting Chief to Regional Fire Coordinators, October 5, 1988, File 15, Box 14, GNP Central Files FY 1988, GNP Archives.

¹²⁸ Divoky interview.

suppression. Glacier's new fire management plan, however, did not retreat from the principles identified in earlier plans. As in the 1977 plan, Glacier's 1990 fire plan discussed alternatives: (1) no action, full suppression, (2) management ignited prescribed fires only, (3) prescribed natural fire only, (4) combined prescribed natural fire and management ignited prescribed fire program (the preferred alternative), and (5) all fires burn unsuppressed.¹²⁹ In discussing the effects of fire on vegetation, wildlife, and other resources, the plan became a brief for arguing why the park needed flexibility in working with fire as a management tool.

In the early 1990s, several lightning-ignited fires were classified as prescribed natural fires and were allowed to burn. However, these fires all occurred at high elevations and remained quite small. The critical test came in 1994, and featured a prescribed natural fire that started at low elevation in the North Fork valley in June. This fire, known as the Howling Fire, covered only a few acres through the months of June and July, but in August it began to spread and at the same time a number of other fires started to burn in and around Glacier. Superintendent Lusk made the crucial decision to request outside assistance for monitoring the Howling Fire even as it remained classified as a prescribed natural fire. His justification was that the park's fire suppression capability was already stretched to its maximum by fires burning elsewhere in the region, yet there would be strong resource benefits in allowing the Howling Fire to run its course. This was the first time that an incident command team was mobilized to monitor rather than suppress a fire. By the time that September rains finally put out the Howling Fire, it had burned 2,000 acres. Subsequent study of the burn area confirmed that the Howling Fire had produced significant resource benefits. Wildland fire managers with the Rocky Mountain Research Station view the Howling Fire as a significant event in reshaping wildland fire management in the pivotal years following the Yellowstone fires of 1988. By deploying an incident command team to monitor a prescribed natural fire, the Howling Fire established a vital precedent for it raised the use of prescribed natural fire to a higher level in the nation's increasingly interagency fire management organization.¹³⁰ In so doing, it enhanced the use of prescribed natural fire as a management tool in fulfillment of long-held objectives that had been gestating since the time of the Leopold Report.

¹²⁹ Glacier National Park, *Environmental Assessment of the Glacier National Park Fire Management Program* (West Glacier, Montana: National Park Service, 1990), 1-2.

¹³⁰ Thomas Zimmerman, Laurie Kurth, and Mitchell Burgard, "The Howling Prescribed Natural Fire – Long-Term Effects on the Modernization of Planning and Implementation of Wildland Fire Management," draft paper provided by Dennis Divoky.



4.8 Historic Preservation

Historic preservation is embedded in the 1916 Park Service mission statement. In its organic act of 1916, the Park Service was given responsibility “to conserve the scenery and the natural and *historic objects* and the wild life” on all lands under its administration (emphasis added). But for many years the Park Service’s idea of conserving “historic objects” was mainly confined to the conservation of historic objects in museum collections. Most cultural resources as they are thought of today received little or no attention in the early years. While the Park Service did employ historians and had a historical program by 1931, most of the effort focused on historical interpretation and custodianship of national historic sites. It was not until after the National Historic Preservation Act of 1966 that the Park Service began to develop a service-wide program of cultural resources management. Even then, historic preservation and cultural resources management did not attain a high profile in large western national parks such as Glacier, mainly because the classification of the national park system into natural areas, historical areas, and recreational areas created a strong organizational bias that tended to promote natural resource management needs over cultural resource management needs in those large, natural-area parks.¹³¹

The National Historic Preservation Act contains three provisions that were significant for the development of cultural resources management in Glacier. First, the act established a National Register of Historic Places for the listing of properties of national, state, or local significance. Evaluation and nomination of properties involved a process of consultation and cooperation with state historic preservation officers, or SHPOs, (and later, tribal historic preservation officers, or THPOs). Second, a 1971 executive order and amendments to the law in 1980 required federal agencies to identify and nominate all qualified properties under their jurisdictions. The Park Service developed an internal register or inventory of culturally significant properties called the

¹³¹ Barry Mackintosh, “The National Park Service and Cultural Resources,” *CRM* 4 (1999), 41-44.

List of Classified Structures. Third, Section 106 of the law directs federal agencies to consider the effects of their actions on National Register listed or eligible properties and to consult with the SHPO, THPOs, and the Advisory Council on Historic Preservation in the course of planning. Resource managers refer to “Section 106 compliance” and “Section 106 consultation” to describe those activities.¹³²

Congress passed the National Historic Preservation Act within two years of passing the Wilderness Act, and although different constituencies were behind each law, both acts stemmed from the same broad concerns. NPS bureau historian Barry Mackintosh has described the setting for passage of the National Historic Preservation Act: “In the decades after World War II, national energies previously subdued by the war effort were unleashed on the American landscape. Dams and other river and harbor improvements, urban renewal projects, airports, interstate highways, and other federal undertakings inundated, damaged, and destroyed archeological sites, old buildings, and neighborhoods, and other cultural properties.” The same national energies and some of the same federal undertakings threatened wilderness areas. The historic preservation movement, just like the wilderness preservation movement, tended to reinforce the conception of national parks as vignettes of primitive America. National parks became havens from the homogenized vacation landscapes of hotel and restaurant chains, amusement parks, commercial campgrounds, and freeway interchanges. In spite of the recent injection of modernist architecture into the national park setting under Mission 66, the predominant architectural style found in most of the big western parks in the 1960s was still National Park Service rustic. Whether the parks’ artfully crafted built environment affected visitors mainly on a conscious or subliminal level, they responded to the parks as places of nostalgia. Increasingly, the Glacier park experience mingled elements of a bygone era – such as riding the red buses or visiting the old chalets – with the more well-known aspects of nature appreciation.

But if the Wilderness Act and the National Historic Preservation Act both played to the same anti-modern impulses, in a narrower sense they could appear to be at cross-purposes. In Glacier, the first effort to inventory historic buildings coincided with the park’s preparation of a backcountry management plan and wilderness recommendation. The Park Service’s *Administrative Policies for Natural Areas* called for removal of structures that were not necessary for the management and preservation of wilderness. Superintendent Briggles and chief ranger Ruben O. Hart wanted to demolish a large number of ranger patrol cabins that dated to the early years of the park and were no

¹³² Ibid, 43.

longer needed. Most of the cabins had been built in the 1920s and 1930s and were not yet fifty years old in 1970. (Fifty years was the somewhat arbitrary age at which a building had to be considered for potential listing on the National Register of Historic Places.) Briggles saw removal of derelict structures as part of what he called “backcountry cleanup.” It was consistent with his conception of “pure wilderness,” or wilderness that showed virtually no trace of human occupancy or use. Consequently, Briggles saw the new requirements of the National Historic Preservation Act as constraining, and he wanted to have a park-wide historic resource study prepared mainly for the negative information it would provide. For each structure that the study evaluated and found ineligible for listing (not historically significant) the park would have carte blanche to raze it.¹³³

Briggles obtained funding for a historic resource study of Glacier in 1970. The Park Service’s research historian James Sheire was given this assignment and completed the study one year later. Briggles was frustrated when the study failed to provide a comprehensive tabulation of all old buildings in the park. Instead, Sheire’s study focused on pre-park history and basically omitted any discussion of the types of old administrative buildings that Briggles was most anxious to be addressed in the report. Briggles complained to Regional Director J. Leonard Volz, and Volz communicated these same concerns to the director of the Western Service Center. “As we understand it,” Volz wrote, “the Historic Resource Studies are prepared to give the Superintendent and Service professionals advice on historic features and recommendations on what structures should be preserved, restored, etc.” Absent a comprehensive tabulation of all old buildings in the park, Volz noted, the park superintendent would have to bring a historian to the park each time “a structure reached the end of its functional life.” At issue, then, was what the park’s historic resource study was supposed to accomplish.¹³⁴

The director of the Western Service Center conceded that Sheire’s historic resource study for Glacier missed the mark in that one respect. “One purpose of this type of study is to identify historic resources – all of them – structures, sites, trails, or whatever. The report should then go further and contain firm recommendations by the historian on the future course of action to be taken in each case, i.e., demolition, stabilization, partial restoration, full restoration, reconstruction, etc.” One reason Sheire

¹³³ Superintendent to Regional Director, April 6, 1970, and Director (Midwest Region) to Director (Western Service Center), March 5, 1971, Folder 7, Box 174, GNP Administrative Records 1910-1984, GNPA.

¹³⁴ Ibid.

had not done so, the director explained, was that the sheer number of structures precluded it. The project had not been adequately funded.¹³⁵

Moreover, Glacier's historic resource study was among the first of its kind to address historic resources in a large natural-area park, and it reflected the Park Service's initial ambivalence toward treating aging park administrative structures as significant historical resources. Sheire focused on the cultural history of Glacier prior to its creation as a national park. This bias toward pre-park history was rooted in the idea of Glacier as a vignette of primitive America. Since old ranger patrol cabins were artifacts of conservation in the first half of the twentieth century, preserving them would detract from the Park Service's goal of providing a window on a much earlier time. For the Park Service to attach historical significance to the national park's own physical development, one of Sheire's colleagues said, would be "unwarranted self-memorialization."¹³⁶

In April 1971, Chief Naturalist Edwin Rothfuss prepared a professional services proposal for a survey of historic structures – taking up the problem where Sheire's study had left it. Rothfuss stated that the park had 12 structures that were over 50 years old (built before 1921) and approximately 35 structures that would pass the 50-year mark in the next half decade. As Rothfuss later recalled, some people on the park staff wanted to burn those buildings before they reached the 50-year mark and Rothfuss strongly opposed them.¹³⁷ When the park did not get funding for a park-wide historic buildings survey, Briggie went ahead with the one-building-at-a-time approach that he had earlier complained would be too costly. He began by requesting \$1,000 for a historian to advise on the maintenance of the St. Mary Ranger Station. Soon thereafter, the park completed a new interpretive prospectus that called for the St. Mary Ranger Station to be restored and refurnished the way it had appeared in 1913 and staffed by an interpretive ranger in period uniform as a living history exhibit, and Rothfuss prepared another project proposal. The estimated cost of restoration was \$26,000. The project was finally awarded in 1974 and most of the restoration work took place in the summer of 1975. Interpretation of the restored historic building began during the national bicentennial in 1976.¹³⁸

¹³⁵ Director, Western Service Center, to Director, Midwest Region, March 22, 1971, Folder 7, Box 174, GNP Administrative Records 1910-1984, GNP Archives.

¹³⁶ James Mote, referring to the historic resource study for Mount Rainier National Park (same time period) quoted in Catton, *National Park, City Playground: Mount Rainier in the Twentieth Century*, 140.

¹³⁷ Rothfuss interview.

¹³⁸ "Survey of Historic Park Structures" (Form 10-240), May 24, 1971, and Superintendent to Director, April 6, 1971, Folder 3, Box 175, and "Restore Historic Ranger Station" (Form 10-238), April 30, 1975, Folder 10, Box 181, GNP Administrative Records 1910-1984, GNPA.

Meanwhile, the Park Service's reluctance to consider its own administrative buildings as historic resources remained in evidence through the 1970s. In September 1971, Briggles offered just two buildings in Glacier as historic properties for listing on the Park Service's own Inventory of Historic Park Structures. (This inventory was limited to historic and archeological properties in natural-area and recreational-area units of the national park system until it was merged with the List of Classified Structures, which was established by the 1968 *Administrative Policies for Historical Areas*.) One of the two, Lake McDonald Lodge, had been constructed during the winter of 1913-14 by John and Olive Lewis. Although the building postdated the establishment of the park, it had been built with private capital on a private inholding. And although the property had been acquired by the park in 1932, the hotel operation had been turned over to the Glacier Park Hotel Company. Thus, it was set apart from the park's large number of administrative buildings. The other, St. Mary Ranger Station, the park mistakenly believed had been built by the Forest Service in 1907-08, when in truth the NPS had constructed the building in 1913.¹³⁹

Superintendent Iversen maintained this narrow focus on pre-park or non-park-administration historic buildings. In 1975, the park submitted five nominations to the National Register of Historic Places. These were for Lake McDonald Lodge, St. Mary Ranger Station, Sperry Chalet, Granite Park Chalet, and Many Glacier Hotel. With the exception of the one ranger station, the properties had been built by private capital and were still being operated by the concessioner. Even these non-park administration properties seemed a bit extraneous to the idea of Glacier as a vignette of primitive America. Iversen noted that at some time in the future the buildings might no longer serve their historic and present function as visitor accommodations. "We feel that once these structures, especially the main buildings, can no longer continue their historical role, the buildings should be removed from the register and razed, and restoration of the sites be a viable consideration."¹⁴⁰ The public probably would not have supported this statement even in 1975. Twenty-five years later, when Secretary of the Interior Bruce Babbitt suggested that Many Glacier Hotel ought to be demolished, it created a public outcry.¹⁴¹

¹³⁹ Superintendent to Regional Director, September 14, 1971, Folder 3, Box 175, GNP Administrative Records 1910-1984, GNP Archives; Glacier National Park, *Annual Report 1913*, and *Annual Report 1914*, typescripts, copies provided by GNP Archives

¹⁴⁰ Superintendent to Regional Director, November 21, 1975, Folder 7, Box 175, GNP Administrative Records, GNP Archives.

¹⁴¹ "Tear Down Many Glacier?" *The Missoulian*, April 6, 2000.

At the same time that the park nominated five buildings for listing in the National Register, it found a sixth building, the Logging Creek Ranger Station, to be eligible but it deferred its nomination. The Logging Creek Ranger Station had been built by the Forest Service prior to the establishment of Glacier National Park. However, its real significance lay in the fact that several outbuildings, dating mostly from the 1930s, were intact. Although the outbuildings were not yet 50 years old, the original building and the outbuildings reflected the character of an operating ranger station in the 1930s. Park managers debated whether to move the entire group of buildings out of the historic flood plain of Logging Creek because the stream had changed course during the flood of 1964 and now periodically ran through three of the buildings. Despite concerns about what moving the buildings would do to their historic integrity of setting, park managers decided to relocate the whole complex to higher ground.¹⁴²

In 1977, a second effort was made to survey all of the park's historic buildings. Henry G. Law and John Albright of the Denver Service Center's Historic Preservation Division produced "Historic Resource Study Part II (Architectural Survey)." Focusing on Section 106 compliance, Law and Albright attempted to evaluate all Park Service-owned structures eligible for listing in the National Register. Their report covered 15 ranger stations together with patrol cabins, lookouts, the headquarters area, and miscellaneous structures. The survey also included an evaluation of the Going-to-the-Sun Road, and one private inholding (Sherwood Inn) that was contemplated for acquisition in the near future. In their recommendations at the end of the 170-page report, Law and Albright laid out a step-by-step plan for the development of a "historical studies program" that the park basically followed over the next four years (though not in the same sequence). First, Law and Albright recommended that their report serve as a preliminary guide for preservation of the historic resources so that a park maintenance crew could begin at once on stabilizing and rehabilitating historic buildings. Eventually, each historic building should have its own preservation guide. Second, they recommended that a historian be added to the park staff. This individual would work on preservation of historic buildings as well as serve as curator for the park's extensive natural history and cultural history collections. Third, the park should obtain another historic resource study to follow up on Sheire's report, this one covering the history of

¹⁴² Superintendent to West Lakes District Manager, November 20, 1974, and Superintendent to Regional Director, August 2, 1976, and Chief of Maintenance to Superintendent, July 1, 1976, Folder 8, Box 175, GNP Administrative Records 1910-1984, GNP Archives.

Glacier National Park since its establishment. Finally, when all of these preliminary needs were met, the park should produce a Historic Resource Management Plan.¹⁴³

In 1978, the Park Service contracted with Historical Research Associates, Inc. (HRA), a consulting firm in Missoula, to produce a historic resource study and historic structures survey. HRA completed this dual report in 1980. The historic resource study highlighted the park's transportation history, including the role of the Great Northern Railway, its grand hotels, and the park's outstanding engineering accomplishment, the Going-to-the-Sun Road, and it provided context for the development of the park's administrative buildings. The historic structures survey focused on privately-owned structures in the Lake McDonald area.¹⁴⁴

In August 1980, Ellen "Sissy" Seeley joined the park staff and though her position title was park technician she was soon given the role of park curator and cultural resources specialist. Superintendent Haraden assigned Seeley to the Interpretation Division, contrary to the recommendation of Law and Albright that the park historian should be assigned to the Resource Management Division. Seeley consulted extensively with Rodd Wheaton, head of the Regional Historical Preservation Team, to develop protocols for work on historic buildings. She coordinated with the superintendent, management assistant, chief of maintenance, and chief ranger to see that the protocols were properly implemented.¹⁴⁵ With her guidance, the park stepped up stabilization and rehabilitation work on historic buildings. In 1980, work crews installed fire escapes and fire alarm systems in the Lake McDonald Lodge and associated buildings, and stabilized the barn at Belly River Ranger Station and the horse concessioner's barn at Many Glacier. The following year, more life safety renovations were made at Lake McDonald Lodge and sill logs were replaced on the Polebridge Ranger Station.¹⁴⁶

Despite the progress made in stabilizing historic buildings, much more needed to be done. To date, the park had identified more than 200 historic buildings in need of stabilization or routine maintenance. Park staff continued to develop procedures for the consultative process mandated by Section 106 of the National Historic Preservation Act and the regional office staff. In May 1982, the park hosted a meeting with Rodd

¹⁴³ Henry G. Law and John Albright, *Historic Resource Study Part II (Architectural Survey)*, *Glacier National Park, Montana*, September 1977, typescript, pp. 168-69, George C. Ruhle Library, GNP.

¹⁴⁴ Alan S. Newell, David Walter, and James R. McDonald, *Historic Resources Study, Glacier National Park and Historic Structures Survey* (Denver: National Park Service, 1980), ii; *Glacier National Park, Annual Report 1978*, typescript, p. 4, copy provided by GNP Archives.

¹⁴⁵ Curator to Superintendent et al., May 27, 1981, Folder 7, Box 176, GNP Administrative Records 1910-1984, GNP Archives.

¹⁴⁶ *Glacier National Park, Annual Report 1980*, typescript, p. 10, and *Annual Report 1981*, typescript, p. 13, copies provided by GNP Archives.

Wheaton and Dick Strait from the regional office, Montana SHPO Marcella Sherfy, and Dave Walter (formerly with HRA, now with the State Historical Society). Apparently the purpose of the meeting was to work toward clarification of roles and responsibilities. Following the meeting, Assistant Superintendent Alan O'Neill wrote to Haraden: "I believe the overall cultural resource management program needs some priority management attention." Haraden agreed. O'Neill based his opinion in part on his growing appreciation of the high value that the public placed on Glacier's historic resources. Haraden, for his part, was concerned that the park secure its proper place in the shared decision making process for nominating properties to the National Register.¹⁴⁷

Later that year, the park contracted with HRA again. This time, HRA's task was to complete the park's inventory for the List of Classified Structures, prepare a multiple property listing for the National Register, and facilitate communications between the SHPO and the Park Service.¹⁴⁸ In the ensuing discussions with HRA, the park wanted to pare down the number of buildings that HRA considered eligible or proposed to include in the nomination. Haraden explained his reasoning to the regional director:

Part of our rationale for omitting many of the backcountry buildings and lookouts is pragmatism. If everything were nominated, then nothing would be special and attention would necessarily be spread thin. We would rather identify a select group of good examples that have integrity then provide concentrated efforts to retain them.¹⁴⁹

The process of surveying the park's historic buildings, initiated with Sheire's study in 1971, finally culminated in the mid 1980s. A total of thirty-nine historic districts or structures were included in the multiple property listing entered in the National Register. The listing covered the park's ranger stations, snowshoe cabins, and fire lookouts, but also included the Gunsight Pass Shelter, Ptarmigan Tunnel, Two Medicine Campstore, and McCarthy Homestead.¹⁵⁰ A Park Service thematic study of architecture in the national parks resulted in Lake McDonald Lodge, Many Glacier Hotel, Granite Park Chalet, Sperry Chalet, and Two Medicine Campstore being designated national historic

¹⁴⁷ Assistant Superintendent to Superintendent, June 2, 1982, Folder 3, Box 174, GNP Administrative Records 1910-1984, GNP Archives.

¹⁴⁸ Glacier National Park, *Annual Report 1982*, typescript, p. 8, copy provided by GNP Archives.

¹⁴⁹ Superintendent to Regional Director, December 15, 1982, Folder 3, Box 175, GNP Administrative Records 1910-1984, GNP Archives. See also Superintendent to Regional Director, March 23, 1983, Folder 4, Box 174.

¹⁵⁰ These are listed by name in Glacier National Park, *Annual Report 1986*, typescript, p. 12, copy provided by GNP Archives.

landmarks in 1987.¹⁵¹ The park's cultural resources management program reached another milestone with completion of a Cultural Resources Management Plan in 1984.¹⁵²

The park and the regional office continued to have disagreements with the SHPO. The concessioner proposed extensive renovations to the exterior and interior of the Lake McDonald Lodge, as well as new landscaping around the premises. The concessioner essentially wanted to flip the front and rear entrances of the main building since guests had arrived by boat when the hotel was built and now arrived by car, entering from the opposite side. Improving the building's functionality had to be weighed against preserving the building's historic character. As Lake McDonald Lodge was listed as a national historic landmark, the design plan had to comply with the *Secretary of the Interior's Standards for Rehabilitation*. The Denver Service Center prepared the design plan and the regional office oversaw the project. The Montana SHPO raised strong objections to the design plan and argued that it did not meet the *Secretary's Standards*, and the Advisory Council on Historic Preservation concurred. The Park Service modified the design plan to retain more of the historic fabric of the building, but proceeded under an adverse effect finding. The renovations were completed in 1989.¹⁵³

By the end of the decade, Glacier had made considerable gains in professionalizing its historic preservation program. Contracting with historical architect Jim McDonald, it completed historic structures reports for several properties including the hotels and chalets. In 1988, a Park Service team from the Williamsport (Maryland) Preservation Training Center provided training to a select crew of park maintenance workers on the maintenance and repair of log and stone historic structures.¹⁵⁴ That same year, Bruce Fladmark replaced Ellen Seeley as the park's cultural resource specialist. His official position was supervisory park ranger and the position remained in the Interpretation Division. In 1990, Deirdre Shaw was hired as the park's first fulltime museum curator. The addition of Shaw raised the number of cultural resources staff to two.

¹⁵¹ National historic landmark status was conferred May 28, 1987. The thematic study was Linda Soulliere Harrison, *Architecture in the Parks National Historic Landmark Theme Study* (Washington: Government Printing Office, 1986).

¹⁵² Glacier National Park, *Cultural Resources Management Plan*, 1984, typescript, p. 59, copy provided by GNP Archives.

¹⁵³ Architect to Assistant Manager, March 4, 1988, Lon Johnson to Lorraine Mintzmyer, May 19, 1988, Richard A. Strait to Johnson, June 7, 1988, and Johnson to Rodd L. Wheaton, June 23, 1988, Folder 17, Box 8, Central Files FY 1988, GNP Archives; Lon Johnson, interview by Theodore Catton, October 22, 2009.

¹⁵⁴ Glacier National Park, *Annual Report 1988*, typescript, p. 25, copy provided by GNP Archives.

It was around this same time – toward the end of the 1980s – that the Going-to-the-Sun Road began to attract intensive interest as a cultural resource. Before the 1980s, all repairs on the Going-to-the-Sun Road were made by the park maintenance staff. Although the park’s maintenance workers labored without the benefit of a preservation guide, they did operate with a preservation ethic. When sections of the road sustained damage they generally took care to put things back the way they were, retaining the road’s original design standards as far as they could tell.¹⁵⁵ In 1982, Congress passed the Surface Transportation Assistance Act, which provided for rehabilitation and upgrading of deteriorating roads in the national park system. The act funded a system-wide transportation planning study by the Park Service in cooperation with the Federal Highway Administration (FHWA). The Park Service approached the task from its customary perspective of balancing preservation and use. The FHWA, meanwhile, sought to apply road safety standards that pertained to road systems outside the parks. A major issue was the fact that average vehicle size had increased in the half century since the road was completed. When the FHWA prepared a Road Rehabilitation Study for Glacier in 1984, it identified more than \$50 million in road repair and rehabilitation needs, mostly on the Going-to-the-Sun Road. It soon became evident that the FHWA’s elaborate plans threatened to degrade the historical integrity of the road. In May 1987, Regional Director Lorraine Mintzmyer signed a Memorandum of Agreement with the Montana SHPO and the Advisory Council on Historic Preservation, which addressed how rehabilitation of the Going-to-the-Sun Road would proceed in light of its historical significance.¹⁵⁶

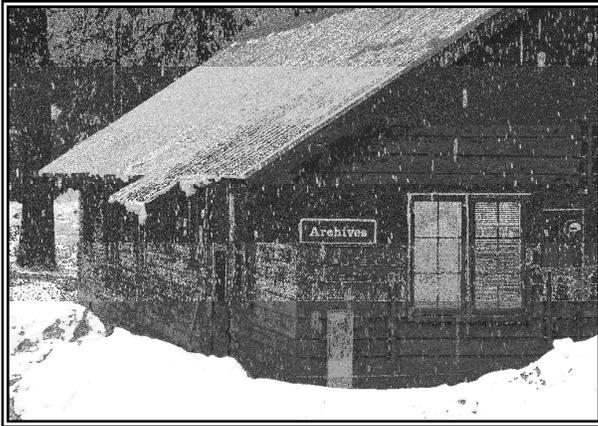
In 1991, the Park Service completed a cultural resources plan for the road’s rehabilitation. It stated that the Park Service was committed to retain a standard road width of just 22 feet despite the increase in volume and size of vehicles. Further, it indicated that the Park Service would aim to restore sections of stone guardrail that had fallen away and were not vulnerable to avalanche or flooding damage. This included sections that had been replaced by log guardrail.¹⁵⁷ Park managers recognized that

¹⁵⁵ There were numerous exceptions. For example, sections of stone guardrail were replaced by non-native stone, concrete faced with stone, or log guardrail. Some sections of the road were widened by filling cutslope ditches. Other sections lost during the 1964 flood were reconstructed and upgraded to a 28-foot road width standard. The West Side Tunnel was realigned, widened, and lined. Overall, however, the road retained the basic design features and character that it had when first completed. See U.S. Department of the Interior, National Park Service, Glacier National Park, *Going-to-the-Sun Road Cultural Resource Plan* (Denver: National Park Service, 1991), 6-7.

¹⁵⁶ U.S. Department of the Interior, National Park Service, Glacier National Park, *Going-to-the-Sun Road Cultural Resource Plan*, 2.

¹⁵⁷ U.S. Department of the Interior, National Park Service, Glacier National Park, *Going-to-the-Sun Road Cultural Resource Plan* (Denver: National Park Service, 1991), 17-18, 21-24.

rehabilitation of the Sun Road was destined to be one of the most expensive, contentious, and long-term construction projects in Glacier's history. They were careful to embed historic preservation in the construction project so that appropriations for the roadwork would cover those related preservation efforts. Over the next two decades, the Sun Road would become one of the most well-documented roads in the national park system, allowing for a high standard of historic preservation.



4.9 Collection Management

As cultural resources management gradually came into its own following passage of the National Historic Preservation Act, it subsumed management of the museum collection. Historically the museum was a function of the Interpretation Division and was strongly oriented to natural history. From the 1920s through the 1950s, practically everything accessioned into the museum collection was classified as herbarium specimens, biological specimens, or geological specimens. In the 1960s, this began to change as numerous historic photographs, cultural artifacts, and document collections were accessioned as well. The changing composition of the museum collection reflected the public's growing interest in preserving cultural heritage.¹⁵⁸

The National Park Service *Museum Handbook* in 1967 listed five criteria for a well-managed museum collection: its specimens were selected purposefully, they were readily available for study, they were well preserved, they were accompanied by adequately organized data, and they were used to their potential in the park program. Purposeful selection depended on a sound and well-defined accession policy consistently applied. Ready accessibility required systematic indexing and storage of specimens. Satisfactory preservation involved issues of security and proper handling of specimens. The permanent linking of objects and supporting data required good recordkeeping.

¹⁵⁸ Deirdre Shaw, comments to author, November 16, 2010; print-out of museum accessions listed by acquisition date, copy provided by GNP Archives.

Effective use of the collection came with good communication between the museum staff, park staff, and interested public.¹⁵⁹ As Glacier's museum collection became more diverse and extensive in the 1960s and 1970s, collection management became more complex. It needed the skills of an archivist as well as a curator. The museum collection itself constituted an important park resource as it came to include thousands of irreplaceable objects and such large items as the "Tally-Ho" wagon used by the Weightman Stage Company and a 1927 Model 54 White Company Bus.¹⁶⁰

The museum collection had its origins in the naturalist's service, later the Interpretation Division. In 1926, Superintendent Kraebel and Morton J. Elrod founded the Glacier National Park Museum Society. Its stated purpose was for "bringing together for the instruction, entertainment, and education of park visitors collections and exhibitions of all kinds of Glacier National Park scientific and natural history material." At this time the collections included both the museum and library collections. Since there was no physical museum or library, the collections were housed temporarily in the headquarters building. The Museum Society was a lean, all-volunteer organization, which faded away as soon as Elrod stepped down in 1928.¹⁶¹

In 1929, George C. Ruhle was appointed as Glacier's first permanent chief naturalist, and he oversaw the museum collection through the next decade. In 1932, the first park museum was established. Located at Many Glacier campground, it consisted of a canvas wall tent erected over a sturdy clapboard frame. The structure had plumbing and electricity. It contained indoor exhibits on geology, entomology, forest pathology, wildflowers, and ichthyology, and outdoor exhibits on young conifers, ferns, and small animals. The Many Glacier tent museum served as a seasonal museum for several years.¹⁶²

Beginning in 1946, the Glacier Natural History Association became the key funding source for upkeep of the museum collection. As the park's official cooperating association, the Glacier Natural History Association raised money primarily through book sales. It was formed under the authority of an act approved May 9, 1938, which

¹⁵⁹ Ralph H. Lewis, *Museum Curatorship in the National Park Service 1904-1982* (Washington: Department of the Interior, National Park Service, Curatorial Services Division, 1993), 291.

¹⁶⁰ Deirdre K. Shaw, "Scope of Collection Statement, Glacier National Park," September 2010, typescript, p. 5, copy provided by GNP Archives.

¹⁶¹ "Glacier National Park Museum Society," 1926, Ansel F. Hall to Superintendent, December 3, 1931, and G. C. Ruhle to Hall, March 4, 1932, Folder 4, Box 163, GNP Administrative Records 1910-1984, GNP Archives.

¹⁶² Glacier National Park, "Annual Report of the Park Naturalist, Year Ending September 30, 1932," Folder 7, and "Annual Report of the Park Naturalist for Year Ending July 1935," Folder 9, Box 191, GNP Administrative Records 1910-1984, GNP Archives.

permitted Park Service field personnel to serve in nonprofit scientific and historical societies engaged in educational work in the various national parks.¹⁶³

The first known scope of collections statement for Glacier was included in the draft interpretive prospectus in 1964. Not surprisingly, it focused on natural history collections as these were the most numerous. Concerning cultural history collections, it divided these into two broad categories: archeology and ethnology, and administration and settlement. Consistent with the idea that Glacier should serve as a vignette of primitive America, the scope of collections statement gave short shrift to the history of Glacier as a national park: “Specimens relating to early settlement and establishment of the Park are most important; those relating to normal operation and administration should receive little, if any, attention.”¹⁶⁴ Fortunately, various park administrative files continued to come into the collection in spite of this statement, contributing to the present administrative history collection of some 200 boxes of archived material.

Glacier’s chief naturalist in the early 1970s, Edwin Rothfuss, recalls that the park’s attention to the museum collection was “pretty meager.” The museum collection was housed in the basement of the headquarters building in a space known as the dungeon. Each summer one seasonal interpreter worked on cataloguing the collection and the rest of the year it was abandoned.¹⁶⁵

In 1976, Ed Jahns, regional curator for the Rocky Mountain Region, visited Glacier to assist the park in upgrading its collection management program. According to his assessment, it would take one person one and a half years to catalogue everything in the collection and bring it up to standard. Fully two thirds of this effort, Jahns estimated, would be required for processing the extensive historical documents.¹⁶⁶ The estimate probably did not take into account the park’s archival collection, which was still maintained as part of the park library. Regardless, the park continued its traditional bias toward the biological specimens and the natural history functions of the museum. When the park completed a scope of collections statement the following year, it explicitly divided the museum collection into natural and cultural collections, which were supposed to relate to the park’s “primary theme” and “secondary theme” respectively.¹⁶⁷

¹⁶³ Shaw, comments to author, November 16, 2010, and Deirdre K. Shaw, “Scope of Collection Statement, Glacier National Park,” September 2010, typescript, p. 5, copy provided by GNP Archives.

¹⁶⁴ John S. Mohlhenrich to Newell Joyner, December 16, 1964, enclosing draft statement, Folder 5, Box 163, GNP Administrative Records 1910-1984, GNP Archives.

¹⁶⁵ Rothfuss interview.

¹⁶⁶ Acting Superintendent to Regional Director, May 27, 1976, Folder 5, Box 163, GNP Administrative Records 1910-1984, GNP Archives.

¹⁶⁷ Glacier National Park, “Scope of Collection Statement,” 1977, Folder 4, Box 162, GNP Administrative Records 1910-1984, GNP Archives.

The museum collection finally began to receive sustained attention when Ellen Seeley was appointed as the park's first cultural resources person in 1980. One of Seeley's first concerns was to find a more adequate space for housing the museum collection. Her suggestion was to move the museum from the basement of the headquarters to the first floor of the West Lakes District Office. Besides affording better treatment of the collection, this space would have the advantage of making the collection more accessible to the resource managers, Seeley pointed out. The park management team considered relocating the collection but finally decided to keep it where it was for the time being.¹⁶⁸ In 1984, most of the collection was moved to a basement addition in the science center. This building, the former administrative annex, contained most of the resource management and research staff offices. In 1990, the museum collection was moved to its present location, the former mess hall. At the same time, the park hired its first fulltime museum technician, Deirdre Shaw.¹⁶⁹

In 1991, following service-wide guidance, the park's archival collection was transferred from the park's library collection to the museum collection. The formal addition of the archival collection greatly increased the overall size of the museum collection, from an estimated 18,062 items in 1989 to an estimated 269,186 items in 1991.¹⁷⁰



4.10 Environmental Monitoring

The main threat to the park from air pollution came from the Anaconda Aluminum Plant in Columbia Falls, which commenced operations in 1955. When it built the plant, the Anaconda Aluminum Company chose the most polluting of four aluminum reduction technologies, the Vertical Stud Söderberg Pot. The plant initially consisted of

¹⁶⁸ Curator to Acting Superintendent, October 27, 1980, Folder 6, and Superintendent to Regional Director, May 7, 1981, enclosing Scope of Collections Statement, Folder 7, Box 163, GNP Administrative Records 1910-1984, GNP Archives.

¹⁶⁹ Deirdre K. Shaw, "Scope of Collection Statement, Glacier National Park," September 2010, typescript, p. 5, copy provided by GNP Archives.

¹⁷⁰ Ibid; Glacier National Park, "Glacier National Park Collection Management Plan," 1989-92, bound report, p. 2, copy provided by GNP Archives.

two pot lines of 120 pots each, with a total production capacity of 67,500 tons of aluminum per year. A third pot line was added in 1965 and two more in 1968 for a total of five pot lines or 600 pots, which raised the plant's output to 180,000 tons per year. Whereas damage from fumes had been localized during the plant's first decade of operation, the increase in air pollution from the additional pot lines began to affect a wider geographic area in the late 1960s. Citizens of Columbia Falls began to notice that trees in the city looked sickly. Samples of foliage were collected, tested in a lab, and shown to contain traces of fluoride sufficient to kill the foliage. The Forest Service immediately began field sampling of foliage at various points within a 14-mile radius of the plant, including the southwest corner of Glacier National Park. Chemical analysis of the foliage samples revealed that fluoride pollution was affecting Douglas fir and lodgepole pine located inside the park.¹⁷¹

The Park Service requested the assistance of the National Air Pollution Control Administration (soon to merge into the Environmental Protection Agency, or EPA) in assessing the effects of fluoride pollution on flora and fauna in the park. EPA initiated field studies in the area during 1970. At the same time, it sponsored a more extensive study of fluoride levels in park flora and fauna conducted by the University of Montana. The results of these studies confirmed that unnatural levels of fluoride were accumulating in the park's biota and that the aluminum reduction plant in Columbia Falls was undoubtedly the source.¹⁷²

In 1974, the Montana State Board of Health and Environmental Science found the Anaconda Aluminum Company's plant to be in violation of state air pollution standards; however, it granted the company a variance that was retroactive to July 1973 and effective through September 1975. In response, the company began retrofitting the plant with pollution abatement technology, an effort that was completed in 1976 at a cost of \$42 million. Superintendent Iversen consulted company officials on the progress of the retrofit. In November 1977, Iversen advised Director William J. Whalen that the Park Service should wait on the results of the retrofit before initiating a lawsuit against the company. Iversen feared that going to court would only result in a financial judgment for natural resource damages when the Park Service's real aim was to get the polluter to cease and desist. But the results of the retrofit were disappointing. Measurements taken

¹⁷¹ Dale S. Thacker to William Briggie, August 19, 1970, enclosing "Flourine Damage – Columbia Falls, Montana," Folder 2, Box 272, GNP Administrative Records 1910-1984, GNP Archives.

¹⁷² U.S. Environmental Protection Agency, Region VIII, Air and Water Programs Division, *Fluoride in Glacier National Park: A Field Investigation* (Denver: Environmental Protection Agency, 1973), xi-xii; C. C. Gordon, "1974-75 Report: Monitoring of Fluoride Accumulation in Glacier National Park," July 17, 1975, Folder 10, Box 272, GNP Administrative Records 1910-1984, GNP Archives.

in the park during the first three months of 1978 showed an increase in ambient fluoride levels over the previous year. According to the Forest Service's information, fluoride emissions at the source had been reduced to 700 to 900 pounds per day, whereas it thought an acceptable level would be about 200 pounds per day. The Forest Service intended to seek an injunction that would require the lower threshold. In August, the Park Service recommended that the Department of the Interior join in the complaint.¹⁷³

Several factors placed the Park Service and the Forest Service at a disadvantage in the lawsuit. Shortly before the suit was filed, Montana's air quality standards were declared unenforceable in a separate court action. The state rewrote the standards, raising the threshold for fluoride emissions to 835 pounds per day. Furthermore, resource damage from air pollution was difficult to prove in a court proceeding. Despite evidence that fluoride levels were still increasing in the park's flora and fauna, the readings measured cumulative effects so it was difficult to determine whether the pollution abatement technology would succeed in reducing fluoride effects over time. Furthermore, fluoride damage was itself difficult to prove. "Fluoride damage near the smelter source is severe and obvious," one investigator explained. "At greater distances from the source, however, effects are subtle and confounded by natural stress or pathogens and disease effects. Great care must be taken in design of experiments to establish legally substantive proof of fluoride damage on Glacier ecosystems."¹⁷⁴ Still another complication, although it did not necessarily affect the litigation, was that Anaconda Aluminum Company was acquired by Atlantic Richfield Company (ARCO) in 1977. The federal government settled the lawsuit with ARCO in 1980 by way of a land exchange. The Forest Service exchanged lands where the fluoride damage was most obvious for company-owned lands that were farther away. The land exchange did not involve lands in Glacier.¹⁷⁵

Another aspect of air pollution that was of special concern to park managers was the effect on visibility. In 1977, Congress passed the Clean Air Act Amendments, which strengthened the Clean Air Act of 1970. Among its provisions, the law classified large national parks, including Glacier, as Class I areas subject to the highest level of protection and enhancement of air quality. The purpose of Class I airshed protection was

¹⁷³ Superintendent to Director, November 15, 1977, Folder 9, Box 277, and Superintendent to Director, June 8, 1978, and Deputy Solicitor to Assistant Attorney General, August 15, 1978, Folder 10, Box 277, GNP Administrative Records 1910-1984, GNP Archives.

¹⁷⁴ AQRV Team to Chief, Special Programs Division, August 23, 1979, Folder 11, Box 277, GNP Administrative Records 1910-1984, GNP Archives,

¹⁷⁵ Glacier National Park, *Statement for Management*, July 1981, typescript, p. 6, George C. Ruhle Library, GNP.

aimed largely at protecting scenic vistas from being degraded by haze. The legislation recognized that fine particulates in the air scatter light and reduce visibility over long distances; therefore regional air pollution could seriously impair visitor enjoyment of the national parks. The Clean Air Act Amendments did two things for the park: it required the state of Montana to consult the superintendent on any proposed development that would degrade air quality in the area, and it provided additional sources of funding for air quality monitoring.¹⁷⁶

Iversen appointed Robert L. Hall, the West Lakes District resource ranger, to serve as the park's air quality coordinator. One of Hall's first tasks was to identify "integral vistas" for visibility protection. Hall's report cited the legislative history behind the park's establishing act in support of the notion that visibility was a park resource. A Senate report in 1908 stated that one reason for creating Glacier National Park was that "the mountain scenery is of unparalleled grandeur and beauty." A House report in 1910 noted a set of scenic photographs that had been submitted for members to see. Hall analyzed these photos and identified nine viewpoints and vistas, all located within the park.¹⁷⁷ The park established visibility monitoring stations at St. Mary, Apgar, and Huckleberry Mountain. With the advent of the Reagan administration in 1981, visibility monitoring became controversial. Visibility impairment was more difficult to measure than chemical pollution and the Reagan administration did not support it. Glacier's visibility monitoring system was scaled back to two stations at Apgar and Lake McDonald Ranger Station. The camera at Apgar was aimed at the Garden Wall, while the camera at Lake McDonald Ranger Station was focused on Teakettle Mountain near the Columbia Falls aluminum plant. Data from the automatic cameras were transmitted via satellite to a National Aeronautics and Space Administration (NASA) facility at Wallops Island, Virginia, and relayed to the National Park Service's air resource specialists located in Fort Collins, Colorado.¹⁷⁸

By the mid 1980s, Glacier National Park had developed a well-rounded environmental monitoring program that embraced a variety of other abiotic elements besides air quality. Air quality monitoring came to include three main components: (1) measurement of fluoride levels in vegetation, (2) measurement of acid deposition, and (3)

¹⁷⁶ U.S. Department of the Interior, National Park Service, Air Resources Division. *Air Quality in the National Parks*, 2nd edition. Lakewood, Colorado: National Park Service, 2002, 1-2.

¹⁷⁷ Robert L. Hall, "Integral Vista Identification," August 27, 1980, Folder 12, Box 277, GNP Administrative Records 1910-1984, GNP Archives.

¹⁷⁸ Air Quality Meeting minutes, December 14, 1982, Folder 4, Box 278, GNP Administrative Records 1910-1984, GNP Archives; Dave Lange, "Annual Report, Resource Management, West Lakes District, 1985," January 15, 1986, Folder 8, Box 15, GNP Central Files FY 1985, GNP Archives.

measurement of particulates. The last category included two systems for sampling large and fine particulates as well as visibility monitoring. In addition, Jim Bennett and Paula Sanchini of the Park Service's new Air Quality Division established an air quality bio-indicator network consisting of lichens, pine, and other sensitive plants located in plots and along transects in the North Fork drainage. Further, the park implemented a water quality monitoring plan in 1984 consisting of a network of eight lakes, one pair in each of the park's four quadrants, one pristine and one developed in each pair. Working with aquatic biologist Jack Stanford at the University of Montana's biological station at Yellow Bay on Flathead Lake, the park acquired baseline information with which to monitor trends in water quality. Finally, the park initiated a noise study to monitor sound levels from oil and gas exploration activities near the park.¹⁷⁹



4.11 External Threats

Environmental monitoring mostly related to threats from pollution coming from point sources located outside the park. As air and water pollution loomed large for the American people in the 1960s and 1970s, the variety of threats posed to national parks came to be identified as “external threats.” The fact that a park’s natural resources could be injured by human activity taking place outside of a park manager’s area of administration raised perplexing questions. Some conservationists argued that the only effective way to protect national parks from external threats was to recognize a “buffer zone” around each park. In theory, the mandate to protect park resources would preclude any type of development within the buffer zone that would harm those resources. If pushed too hard, however, the concept of a buffer zone could seem almost tantamount to expanding the area of the park. Proponents of the development would point out that

¹⁷⁹ Acting Superintendent to Chief, WASO, Air and Water Quality Division, March 12, 1986, Folder 5, Box 11, GNP Central Files FY 1986, GNP Archives; Glacier National Park, *Annual Report 1984*, typescript, p. 20, copy provided by GNP Archives; Gregory interview. Acid precipitation in Glacier is discussed in K. Ganesan to Clifford Martinka, December 3, 1985, enclosing Kumaraswamy Ganesan, “Acid Precipitation Study in Montana,” Folder 16, Box 10, GNP Central Files FY 1986, GNP Archives.

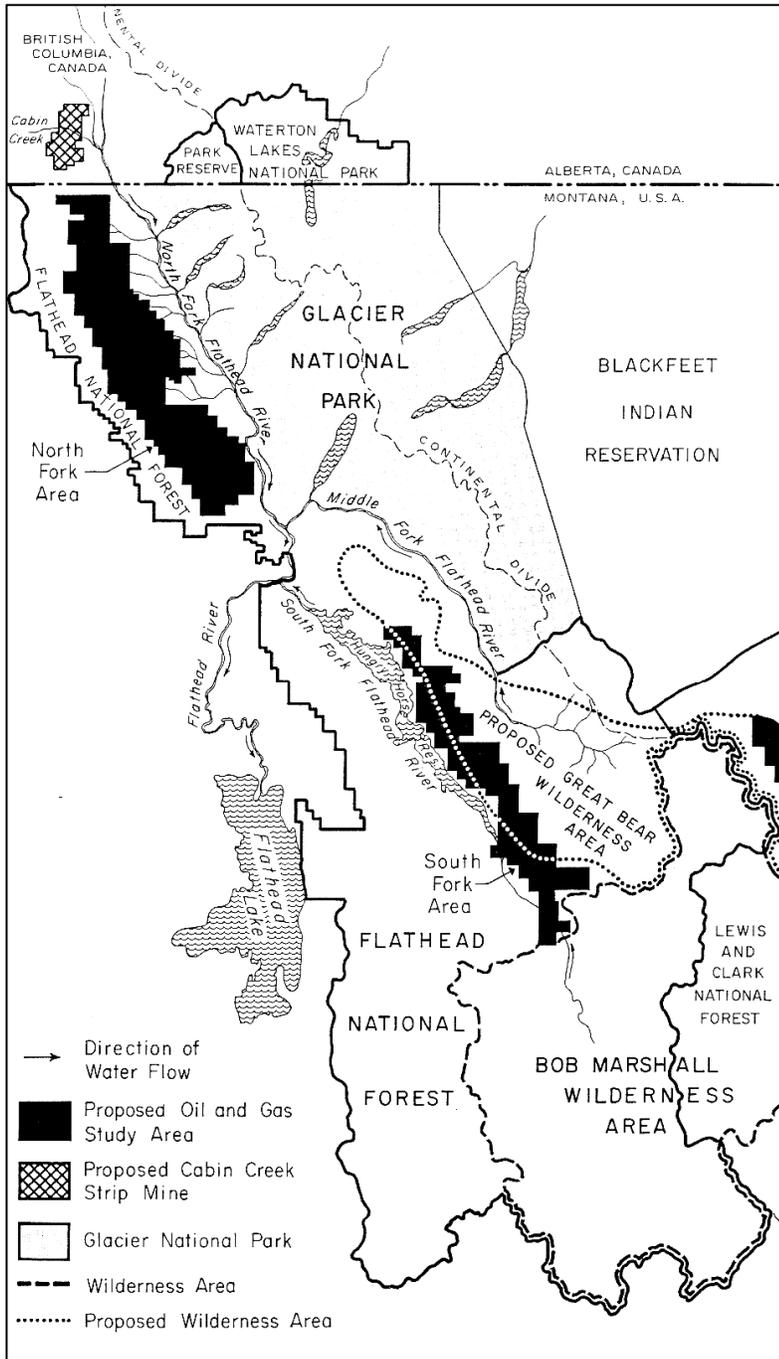
Congress had left the area outside of the park for a reason – so that its natural resources could be exploited. With that kind of backlash in mind, park managers hesitated to peddle the idea of a buffer zone unless the external threat was huge, such as the threat of a dam on the North Fork that would have inundated land inside the park. In most cases, park managers sought to address external threats through interagency cooperation. As difficult as interagency cooperation could be, it did not provoke a backlash.¹⁸⁰

External threats increased in prominence in the wake of the Park Service's *State of the Parks* report to Congress in May 1980. Based on an extensive survey of park managers, the report enumerated threats to resources in each park and then characterized the threats to the parks overall. "Threats" as defined in the report included threats to resources from pollution, industrial development projects, invasive exotic species, and visitor activities. All threats were grouped into two main categories: external and internal. One of the major findings of *State of the Parks* was that more than half of all threats in the national park system were external threats. Another major finding was that the 63 natural-area units that contained more than 30,000 acres had two times the average number of threats per unit, and that the 12 natural-area units that had been designated as biosphere reserves under the United Nation's Man and the Biosphere Program had three times the average number of threats.¹⁸¹

Glacier National Park had the dubious honor of having more threats than any other park. Glacier's place at the top of the list seemed to prove the point that large size and relatively pristine biological resources did not insulate a park from external threats. The NPCA and other conservation organizations gave the imperiled park much press in their magazines and newsletters following *State of the Parks*. While Glacier's threatened status was real enough, in actual fact the sheer number of threats to the park was somewhat contrived, according to former chief ranger Chuck Sigler. Glacier's resource managers had learned through bitter experience that when the park asked for money to address an issue it stood a much better chance of receiving help if the issue had been previously identified. So when the questionnaire for the report to Congress arrived in the park's mail bag, Sigler and resource management specialist Clyde Fauley took pains to include every conceivable issue in the record. Sigler was not entirely surprised when

¹⁸⁰ Joseph L. Sax and Robert B. Keiter, "Glacier National Park and Its Neighbors: A Study of Federal Interagency Relations," *Ecology Law Quarterly* 14, no. 2 (1987): 207-64, especially 249. In this essay the authors argue that park managers were not making best use of legal authorities and were being timid in addressing external threats.

¹⁸¹ Office of Science and Technology, National Park Service, *State of the Parks, May 1980, A Report to the Congress*, in *America's National Park System: The Critical Documents*, edited by Lary M. Dilsaver (Lanham, Maryland: Rowman & Littlefield Publishers, Inc., 1994), 406.



Threats to Glacier National Park. (Source: National Parks & Conservation Magazine, November 1975).

Glacier was named the most threatened park in the system. He hoped the notoriety would translate into money, but as far as he could tell the park “never got a cent out of it.”¹⁸² Glacier’s superintendent and other key staff were also disappointed when the notoriety failed to translate into base funding increases for research and resource management.¹⁸³

But viewed in historical perspective, the negative publicity that Glacier received from the *State of the Parks* report did contribute significantly to an important shift in resource management. If Glacier’s top billing in *State of the Parks* had much immediate impact, it was on the general public rather than public officials. It energized grassroots support for the park. Organizations such as the Flathead Coalition redoubled their efforts to protect Glacier and to oppose potential industrial developments that would harm park resources.¹⁸⁴ Local residents took more notice of the park’s challenges. Over time, park officials responded to the multitude of external threats by devoting more and more of their energies to working with park neighbors – the national forests, the tribes, state and local governments, and community organizations – in a long-range effort to develop a consensus-based or regional approach to environmental issues. Park officials only did so because they perceived that the general public would rally behind the park when push came to shove. The growing emphasis on public education and regionalism would form one of the underpinnings of ecosystem management in the 1990s, the next and latest paradigm shift in Glacier’s approach to resource management.

In the mid-1980s, environmental law professors Joseph L. Sax and Robert B. Keiter made an in-depth analysis of the park administration’s relations with its many neighbors. Describing their work as a case study of federal interagency cooperation, Sax and Keiter featured Glacier precisely because of its prominent place in the *State of the Parks* report. For their study, Sax and Keiter interviewed 46 individuals in western Montana, including 13 on the Glacier National Park staff, and examined three main issues: oil and gas development on the neighboring national forests, potential paving of the North Fork Road, and the proposed Cabin Creek Mine in British Columbia. Their assessment, which they put into a 57-page article in *Ecology Law Quarterly*, was not very encouraging. They found the park truly beset by dire threats, and they recommended that the park take a more confrontational approach to protect its natural resources, using the Endangered Species Act and other environmental laws to establish a de facto buffer area

¹⁸² Sigler interview.

¹⁸³ Superintendent to Regional Director, November 5, 1981, Folder 3, Box 267, GNP Administrative Records 1910-1984, GNP Archives.

¹⁸⁴ Robert C. Haraden, “Statement for Management, Glacier National Park,” July 23, 1981, George C. Ruhle Library, GNP.

around the park. While the report by Sax and Keiter did not prompt any official response by the park administration, it was a sober follow-up to the *State of the Parks* report.

Of all the external threats to Glacier, the most significant and intractable one was located north of the border in British Columbia. There, in the headwaters of the North Fork of the Flathead River, a British mining corporation by the name of Rio Algom Mines Ltd. wanted to open a giant coal mine. (Later the effort was handed to a subsidiary, Sage Creek Coal, Ltd.) The proposed development would have involved two or three open-pit mines, each more than a mile wide and nearly a half mile deep. During the projected 22-year life of the project, the mining operation was expected to produce some 40 million cubic yards of tailings. Waste water was to be treated and then discharged into the North Fork. The project would have introduced a community of perhaps 7,000 people where there were currently just two families residing on a year-round basis.¹⁸⁵

When the proposal became public, a number of local organizations and individuals combined efforts to form the Flathead Coalition. The grassroots campaign to stop the coal mine soon enlisted the support of Representative Max Baucus (D-MT), who appealed to the U.S. State Department to relay Montana's concerns to Canadian officials. As a result of that diplomatic initiative, a U.S. interagency task force, which included representatives of the State Department, EPA, the Forest Service, and the Department of the Interior, as well as state officials, consulted with Canada's Department of External Affairs. The consultation resulted in a plan by which Sage Creek Coal, Ltd., would prepare a Stage I proposal followed by a Stage II proposal.¹⁸⁶

The company submitted its Stage I proposal in July 1976 and it was approved by the British Columbia government in October. The company completed its Stage II proposal in late 1979 and it was rejected in early 1980, in part because of unresolved threats to downstream water quality. In the meantime, Baucus initiated a Flathead River Basin environmental impact study and requested that the State Department pursue the matter with the International Joint Commission (IJC), a body that had been established early in the twentieth century to adjudicate disputes between the United States and Canada under the Boundary Waters Treaty of 1909. At first the State Department demurred. But when the mining company came back with a revised Stage II proposal in

¹⁸⁵ Gene Albert, "Glacier: Beleaguered Park of 1975," *National Parks & Conservation Magazine* (November 1975), 5-7.

¹⁸⁶ David K. W. Wilson, Jr., "Cabin Creek and International Law – An Overview," *The Public Land Law Review* 5 (Spring 1984), 114-15.

1984, and the British Columbia government granted approval-in-principle, the State Department decided to seek an IJC referral.¹⁸⁷

Legal scholars Sax and Keiter described the fate of the Cabin Creek Mine proposal in their case study of Glacier National Park and the problem of external threats. They noted that the State Department's intervention was a "dramatic step" and "quite unusual" and they explained why it occurred:

The Park Service was in the happy situation of being allied with every other interest group on the United States side, and it considered the Cabin Creek issue to be very serious. Everything came together. The State Department, initially reluctant, decided to pursue the reference because it saw an opportunity to point its finger at Canada as the bad guy for a change. Canada, yet more surprisingly, agreed to the reference, probably perceiving an opportunity to make some modest concessions to United States concerns and to improve its position in seeking concessions on acid rain.¹⁸⁸

In the meantime, EPA completed the Flathead River Basin environmental impact study, which considerably strengthened the case against mining development. The State of Montana was active as well, producing a 100-page technical paper that it presented to the premier of British Columbia. The Park Service, for its part, participated directly in negotiations with Canadian officials and contributed field research to the Flathead River Basin study group. When the IJC formed the Flathead River Interagency Study Board to investigate the matter, the Park Service was designated the lead federal agency for that investigation.¹⁸⁹

The IJC recommended against the Cabin Creek Mine proposal and recommended that the State of Montana and the Province of British Columbia work toward an accord on land use in the upper Flathead River Basin. While successive Montana governors sought to reach such an accord, that final goal was elusive. Meanwhile, Sage Creek withdrew its proposal due to market conditions, so the threat receded without a political solution.

¹⁸⁷ Glenn Oakley, "The Valley That Roared," *Seriatim*, 2 (Winter 1978), 28-29; David K. W. Wilson, Jr., "Cabin Creek and International Law – An Overview," *The Public Land Law Review* 5 (Spring 1984), 113; Max Baucus to Cyrus R. Vance, October 16, 1979, Folder 6, Box 236, GNP Administrative Records 1910-1984, GNP Archives.

¹⁸⁸ Sax and Keiter, "Glacier National Park and Its Neighbors: A Study of Federal Interagency Relations," 239.

¹⁸⁹ Glacier National Park, "Briefing Statement, Proposed Sage Creek Coal Company, Ltd., Coal Development," 1985, Folder 4, Box 9, GNP Central Files FY 1987, GNP Archives.

Another external threat came from increased logging activity in the North Fork drainage. Logging on the Flathead National Forest in the 1970s and early 1980s resulted in clearcuts that were visible from within the park. These logged slopes not only marred scenic vistas from points inside the park, they also threatened to increase sedimentation within the shared drainage area and degrade fish and wildlife habitat along the park boundary. Logging trucks thundered down the primitive North Fork Road, impacting visitor experience as well as wildlife. On the positive side, the Forest Service showed a greater willingness to consult with park officials on proposed timber sales located in view of the park, and in the early 1980s it set aside the northern third of its North Fork drainage area as the Trail Creek Grizzly Bear Management Area to assist with grizzly bear recovery and to provide habitat for the endangered gray wolf. Timber sales were prohibited for ten years in this area and the Flathead National Forest's allowable cut was reduced accordingly.¹⁹⁰ While park officials found encouraging trends on the Flathead National Forest, however, they anticipated more heavy logging to occur north of the border in British Columbia.¹⁹¹

Potential upgrading or paving of the North Fork Road constituted another external threat to the park, since improved road access would bring more people into the area and lead to a host of other environmental impacts. Glacier's *Final Master Plan*, completed in 1977, identified the road-accessible area of the North Fork drainage as a "wilderness threshold zone" – an area where visitors could find more solitude than was generally afforded along the main road corridor through the park. Consistent with the master plan, park officials opposed plans to upgrade, widen, or pave the primitive dirt road. As chief ranger Chuck Sigler advised the U.S. Department Transportation in 1981, improved access would inevitably bring more people into the area and that would cause an array of adverse effects, including increased pressure on the threatened grizzly bear, depreciation of wilderness values, and adverse impacts on qualities associated with the North Fork Wild and Scenic River. Private lands in the area would likely be developed, leading to demand for services such as sewage, garbage, law enforcement, and fire protection.¹⁹²

Despite opposition to the proposal, Flathead County put forward a plan to widen and pave the lower ten miles of the road as far as its junction with the Camas Road. The

¹⁹⁰ Maura J. Longden, "The 1985 Resource Management Program in the North Fork, Glacier National Park," November 20, 1985, Folder 8, Box 15, GNP Central Files FY 1985; Sax and Keiter, "Glacier National Park and Its Neighbors: A Study of Federal Interagency Relations," 227-29.

¹⁹¹ Sax and Keiter, "Glacier National Park and Its Neighbors: A Study of Federal Interagency Relations," 227-29; Glacier National Park, "Briefing Statement, British Columbia Logging," 1986, Folder 4, Box 9, GNP Central Files FY 1987, GNP Archives.

¹⁹² Charles B. Sigler to J. L. Budwig, August 24, 1981, Folder 17, Box 233, GNP Administrative Records 1910-1984, GNP Archives.

Park Service conducted a visitor survey of recreational users in the North Fork, which found that most people were content with the existing level of development. The Fish and Wildlife Service issued a jeopardy opinion under the Endangered Species Act, which stated that the project would be a threat to both the grizzly bear and the gray wolf. Sax and Keiter, in their mid-1980s study of Glacier's relations with its neighbors, found that the park administration made a deliberate choice to let the Fish and Wildlife Service knock down the proposal while it focused on consensus-building. Park officials, together with Forest Service and county representatives and local residents, began meeting informally as the North Fork Coordinating Committee. One park official told Sax and Keiter, "We were a second line player, and we hid behind the grizzly bear."¹⁹³ Its strategy worked as the park achieved its objective without provoking a backlash from property owners on the edge of the park. In the meantime, the park initiated a development concept plan to study facility needs in the North Fork. As pressure to pave the road abated, the park quietly rolled that planning effort into a broader management plan for the North Fork, which was finally completed in 1992. The plan buttressed the park's commitment to maintaining the North Fork's primitive qualities.¹⁹⁴

Oil and gas development posed yet another external threat to Glacier in the 1980s. It was perhaps the most worrisome to park officials because exploratory drilling was a diffuse and incremental threat that did not necessarily spark public opposition and it had big money behind it. Resource managers found the threat of oil and gas development particularly insidious because any given proposal involved only a small tract of land and proponents of the development could deflect opposition by emphasizing that it was only exploratory. The industry's claim that an exploratory well had minimal impacts was accurate to a point, but if the well produced then the next stage of development would potentially have profound environmental consequences. Moreover, even the minimal impacts of a single oil and gas drilling operation (noise, truck traffic, localized human activity) became magnified through the cumulative effect of numerous sites. The park urged the Forest Service to take a comprehensive view and evaluate environmental effects of oil and gas exploration based on the potential of full field development. The Forest Service refused, insisting on segmenting the process so that each oil and gas lease was evaluated based on the impacts of exploration activity alone. On this issue the Park Service received no help from the Bureau of Land Management (BLM), which had

¹⁹³ Sax and Keiter, "Glacier National Park and Its Neighbors: A Study of Federal Interagency Relations," 235.

¹⁹⁴ U.S. Department of the Interior, National Park Service, *Management Plan, North Fork Study Area, Glacier National Park, Montana* (Washington: U.S. Department of the Interior, National Park Service, 1992), 1.

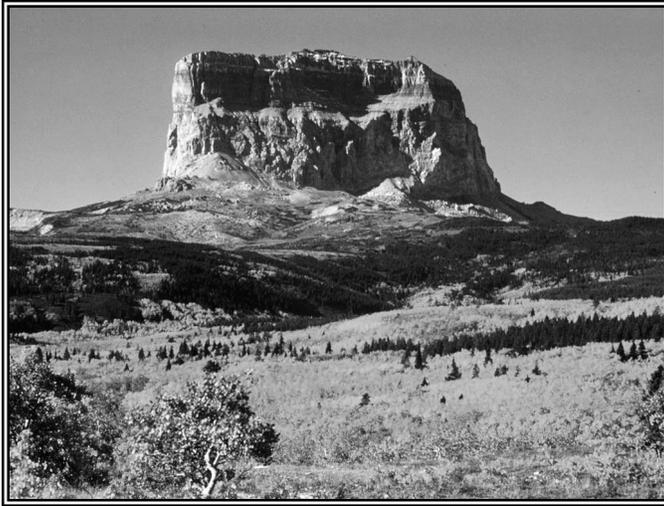
responsibility for administering oil and gas leases on the national forests. But when conservation groups challenged the Forest Service in court, claiming that the agency needed to do a comprehensive EIS to comply with NEPA, the court ruled on the side of the conservation groups and the drilling was prevented.¹⁹⁵

From the 1970s to the early 1980s the contest over oil and gas leasing focused mainly on the Flathead National Forest. Then the park's concern abruptly shifted to the Badger-Two Medicine area on the Lewis and Clark National Forest. This area of approximately 130,000 acres is bounded on the north by Glacier, on the east by the Blackfeet Reservation, and on the south and west by the Great Bear and Bob Marshall wilderness areas. In 1982, the Lewis and Clark National Forest granted 47 leases for natural gas development. Despite the court decision that struck down the oil leases on the Flathead National Forest, the Forest Service held to its piecemeal approach in the Badger-Two Medicine, and conservationists had to fight the oil development one lease at a time, mostly resorting to the Forest Service's administrative appeals process to hold up lessee's Applications for Permit to Drill (APD). Chevron, the major leaseholder in the Badger-Two Medicine area, spearheaded an EIS for an APD on Goat Mountain, located near the park boundary. The Forest Service finally approved the APD in 1991, but the BLM called for a remand and the leases were suspended.¹⁹⁶ During these proceedings, resource managers on the Glacier National Park staff weighed in at every opportunity in the other agencies' environmental review process. Choosing interagency cooperation over confrontation, park officials saw their role as bringing those land managers in the Forest Service and the BLM to the realization that they had a role in protecting Glacier. Gary Gregory, looking back on the experience, thought this approach finally bore fruit. "We had a lot of neighbors thinking differently as a result of that process."¹⁹⁷ Still, the controversy over oil and gas drilling in the Badger-Two Medicine would continue to fester through the next two decades.

¹⁹⁵ Sax and Keiter, "Glacier National Park and Its Neighbors: A Study of Federal Interagency Relations," 231-33; Gregory interview.

¹⁹⁶ Gloria Flora, "Badger-Two Medicine Leasing History" (March 2004), at <http://www.nativeforest.org/campaigns> <February 24, 2010>. Also see Glacier National Park, "Briefing Statement, Oil and Gas Activity near Glacier National Park," July 12, 1994, in National Park Service, *Glacier National Park July 12, 1994 Briefing Statements*, George C. Ruhle Library, GNP.

¹⁹⁷ Gregory interview. Also see Glacier National Park, *Natural Resource Management Plan and Environmental Assessment*, 1983, typescript, p. 19, George C. Ruhle Library, GNP.



4.12 Archeology

The first archeological reconnaissance in Glacier was made in 1963 by Carling Malouf, a professor of anthropology at the University of Montana. The Park Service contracted for the study as part of a Mission 66 project to develop the Camas Road. The archeological survey crew began with the road corridor, then moved on to survey the shores of Lake McDonald and sections of the North Fork valley, and ended with a brief survey of sample sites on St. Mary Lake. Malouf hoped to relate discoveries on the west side of Glacier to recent finds made on the shores of Flathead Lake, which were the most significant archeological sites in western Montana known to date. The results of the reconnaissance were in Malouf's words "very disappointing." Nine sites were recorded. Malouf deliberately concentrated on the west side of the park in the hope that another contract would allow a reconnaissance of the more promising east side at some future time.¹⁹⁸

The next archeological field study in Glacier occurred in the summer of 1970 as part of an eight-week reconnaissance of the Flathead River drainages made in conjunction with area designations under the Wild and Scenic Rivers Act of 1968. The survey crew comprised five anthropologists from the University of Montana, including Ann M. Johnson, who subsequently went to work for the Park Service regional office in Denver and provided some oversight of Glacier's archeological resources from that position in the 1980s. Although the study was spread over 57,600 acres primarily on the Flathead National Forest and was funded entirely by the Forest Service, it did include

¹⁹⁸ Carling Malouf, "Archaeological Reconnaissance, Vicinity of West Glacier, Glacier National Park, Montana, 1963," typescript, June 1, 1965, Folder 1963 Archeo. Investigations – Malouf, Cultural Resource Specialist Office Files, GNP.

several areas in Glacier along the North Fork and Middle Fork. A total of 23 sites were located throughout the study area, including four in the park.¹⁹⁹

Following this survey, another member of this team, Floyd W. Sharrock, who was chairman of the Department of Anthropology and director of the University of Montana Statewide Archaeological Survey, submitted a proposal to the Park Service to make a three-year archeological study in Glacier National Park. The Midwest Region declined to fund the project, and from Sharrock's perspective the Park Service added insult to injury when it contracted with an out-of-state organization to conduct archeological field work at another Montana location. Sharrock tried again two years later, writing to Montana's Senator Lee Metcalf for help in initiating the survey. Metcalf forwarded the proposal to Director Hartzog, who passed it along to the regional director without significant comment. The Midwest Region politely informed Sharrock that the funding for the archeological survey of Glacier was not in the Park Service's current budget, explaining that the request must originate with the park superintendent.²⁰⁰

Sharrock's impatience with the Park Service was not unfounded, for the National Historic Preservation Act appeared to provide strong direction for all federal land managing agencies to step up archeological investigations on federal lands, and President Nixon reinforced that message with Executive Order 11593, which directed all federal agencies to exercise leadership in preserving, restoring, and maintaining cultural properties under their stewardship.²⁰¹ In the early 1970s, many university anthropology departments across the United States avidly pursued this new field, which they called "cultural resources management," or CRM. The major limitation of CRM archeology was that it was compliance driven; surveys were conducted in advance of bulldozers and from an archeologist's standpoint were arbitrarily located. Projects were usually small scale, often linear, and not necessarily situated in areas likely to yield archeological resources. This pattern was characteristic of archeological surveys in Glacier through the rest of the decade. In 1974, R. K. Nickel of the Park Service's Midwest Archeological Center surveyed construction zones prior to reconstruction of the Lake McDonald and

¹⁹⁹ Dale E. Fredlund and Lynn Fredlund, "Archaeological Survey of the Flathead River Drainages: A Preliminary Report," 1970, File Archeology 1970, Cultural Resource Specialist Office Files, GNP; Anonymous, "History of Archeological Research," no date, Folder 9, Box 6, Central Files FY 1987, GNP Archives.

²⁰⁰ Floyd W. Sharrock to Lee Metcalf, September 28, 1972, Metcalf to George B. Hartzog, Jr., October 10, 1972, and John Kawamoto to Sharrock, October 10, 1972, Folder 7, Box 174, GNP Administrative Records 1910-1984, GNPA.

²⁰¹ Glacier National Park, *Cultural Resources Management Plan*, 1984, typescript, pp. 19-20, copy provided by GNP Archives; Glacier National Park, *Annual Report 1995*, typescript, p. 25, copy provided by GNP Archives.

Many Glacier sewer systems and Floyd Sharrock surveyed 3.6 miles adjacent to U.S. Highway 2 east of Essex Bridge; no sites were recorded in either case. In 1975, Nickel surveyed the proposed location of the Rising Sun sewer system and Sharrock surveyed a swath of ground adjacent to the Chief Mountain Highway; again, no sites were recorded. In 1976, Anthony Zalucha and Alan Thompson of the Midwest Archeological Center surveyed three utility areas located at Waterton Ranger Station, St. Mary, and Many Glacier and found no sites. More surveys in 1977, 1978, and 1979 also yielded no findings.²⁰²

The park's cultural resources management plan, completed in 1984, called for an archeological overview and assessment. Ann Johnson joined in urging an archeological survey of the whole park, noting that this did not mean a survey of 100 percent of the park's land area. Rather, a realistic goal would be to survey five percent of the park, targeting those areas most likely to yield evidence of prehistoric occupation and use. In addition, the survey would focus on developed areas (where potential archeological resources would be most vulnerable) known sites (primarily historic archeology) and culturally modified trees. The latter deserved high priority since they were vulnerable to natural fire, prescribed burns, and the tree's life cycle. Glacier and the Flathead National Forest co-sponsored a survey of culturally scarred trees in the mid 1980s. An interesting facet of this survey was that by taking core samples from these trees it was possible to date when the tree had been culturally modified, which provided new clues about Indian use of the area in the early nineteenth century.²⁰³

Glacier finally received a funding allotment to initiate an archeological overview and assessment in 1990. The Park Service contracted with Brian O. K. Reeves, professor of anthropology at the University of Calgary. The final report, *Mistakis: The Archeology of Waterton-Glacier International Peace Park*, was published in 2003. Reeves and his team located hundreds of archeological sites, increasing the number of known sites many fold. By then it came as no surprise to resource managers that Glacier had such a rich prehistory; scientific knowledge of human prehistory in the Northern Rocky Mountains had long since exploded the myth that prehistoric cultures mostly avoided high mountain areas. Still, this comprehensive study strongly reinforced resource managers'

²⁰² Anonymous, "History of Archeological Research," no date, Folder 9, Box 6, Central Files FY 1987, GNP Archives.

²⁰³ Glacier National Park, *Cultural Resources Management Plan*, 1984, typescript, pp. 21-22, copy provided by GNP Archives; Gregory interview; Bruce Fladmark, interview by Theodore Catton, October 22, 2009.

appreciation of the extent to which humans had influenced the natural environment prior to the park's establishment.²⁰⁴

Publication of *Mistakis: The Archeology of Waterton-Glacier International Peace Park* constituted something like a bookend for the era that had begun forty years earlier with the Leopold Report. When the park area was re-conceptualized as an arena for human interaction with the environment spanning many thousands of years, then the idea of Glacier as a “vignette of primitive America” truly became obsolete. The project of ecological restoration – and more specifically, the project of recreating conditions that prevailed when the white man arrived – had appeared as a noble dream in 1963. Now this metaphor of nature had lost its appeal. Nature had never been such a static entity as ecological restoration implied. The vignette of primitive America now seemed as lifeless as a natural history diorama in a museum. The new management paradigm that emerged at the end of the twentieth century centered on the ecological concept of the ecosystem. It was dynamic rather than static, and it sought to integrate the natural with the cultural rather than placing them in juxtaposition.

²⁰⁴ Potter, “Historical Reflections of Glacier: A 40-Year Personal Journey.”

Chapter 5 A Sustainable Ecosystem



5.1 The Crown of the Continent Ecosystem

In the present-day conceptualization of Glacier's natural environment, the park lies at the center of a relatively pristine mosaic of protected areas encompassing other federal, state, and tribally-owned lands. The larger area is called the Crown of the Continent Ecosystem (CCE) and Waterton-Glacier International Peace Park forms its core. As with previous re-conceptualizations of the park, this one is layered on top of earlier ones, as the following description of the region found in a recent book about land management in the CCE illustrates.

Tucked away within the continental folds of the great Rocky Mountain chain in southern Canada and western America, one last, truly wild place remains. Sequestered in southern British Columbia, Alberta, and northern Montana is a landscape that has escaped the heavy hand of modern humans, a place so vast and undeveloped that much of it is still roadless wilderness. For more than 170 miles, the Rockies rise from the land in a spectacular thrust of sharp mountain peaks covered with great swaths of forest. Whole river systems still function here without the impediment of dams, flowing seaward with glass-clear, unpolluted waters. Cupped within the depths of the mountains are hundreds upon hundreds of shimmering lakes of remarkable color and transparency. This is a region so stunningly beautiful that it could have inspired a magnificent opus or a legendary painting. It is a place so wild that it is the stronghold for grizzly bears in the contiguous United States, so wild that it retains a more intact assemblage of native mammals than anywhere else from the Mexican border to west-central Canada. This landscape is a thriving ecosystem of remarkable richness and uncommon biological diversity. This is truly a place like no other, a piece of

Eden rising above an industrializing world. It is a place known fittingly as the Crown of the Continent Ecosystem.¹

This description incorporates all of the past conceptualizations of nature that shaped resource management in Glacier from 1910 through the end of the twentieth century. It reflects the game conservationists' concept of the park as a reservoir or stockyard for the replenishment of game populations, here recast as "the stronghold for grizzly bears in the contiguous United States." It exhibits the ideal of complete sanctuary first articulated in the 1930s, crediting the region with having "a more intact assemblage of native mammals than anywhere else from the Mexican border to west-central Canada." And it echoes the Leopold Report's statement that a national park should represent a vignette of primitive America with the phrase "a piece of Eden rising above an industrializing world." But to these three older conceptualizations of nature, the description adds a fourth: the notion of a "thriving ecosystem."

The ecosystem concept is nearly as old as ecology itself. In its original usage, the term "ecosystem" referred to all of the biotic and abiotic components in an area considered as a whole.² In its modern usage as a basis for land management it has acquired additional meanings. Ecosystem management refers to the integration of cultural, social, and economic as well as ecological considerations in the formulation of land management options. Ecosystem management posits that the relationship between humankind and nature is both hierarchical and mutual. Humankind is a dominating force in nature and capable of manipulating it, and at the same time the human species is a part of nature and ultimately dependent on it. While "EM" represents an extension of the managerial ethos of the Progressive conservation era, it also incorporates the tradition of communion with nature associated with naturalists like John Muir. In attitude, it has elements of both hubris and humility.³

What is new in this picture is the notion of sustainability. In this latest way of thinking, preservation efforts within the park ultimately rest on the development of

¹ Ralph Walcott, "Foreword," in Tony Prato and Dan Fagre, editors, *Sustaining Rocky Mountain Landscapes: Science, Policy, and Management for the Crown of the Continent Ecosystem* (Washington: Resources for the Future, 2007) ix.

² The term was coined by the British botanist Sir Arthur Tansley in 1935. See Eugene P. Odum, *Ecology and Our Endangered Life-Support Systems* (Sunderland, Massachusetts: Sinauer Associates, Inc., 1989), 38.

³ An authoritative summary of ecosystem management is R. Edward Grumbine, "What is Ecosystem Management?" *Conservation Biology* 8 (March 1994): 27-38. A working definition developed for park management is J. K. Agee and D. R. Johnson, "Ecosystem management for national parks," *Courier* 34, no. 12 (1989): 6-9. An overview of EM implications for Glacier is Karen J. Schmidt, ed., *Biodiversity in Glacier*, revised and updated by Susan Olin (West Glacier: Glacier National Park, 1993).

sustainable communities and land use practices over a much wider area surrounding the park. Sustainable development has been defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”⁴ The thrust of the new thinking is to meld economic and environmental concerns into a unified program. It posits that the environment cannot be protected effectively without economic development, nor can economic development be sustained without environmental protection. Resource management in Glacier in the modern era is a blend of old and new. It blends older, traditional modes of thinking based on laws and policies that are applicable only inside the park, and newer, revolutionary modes of thinking that seek to form linkages between the park and its neighbors and between social and ecological systems.

The roots of ecosystem management in Glacier’s history can be traced back to the 1970s if not earlier. The interagency effort to recover the grizzly bear was perhaps the first major antecedent of ecosystem management. Even though on its face the Endangered Species Act appeared to reinforce the older tendency in wildlife management to manage for the welfare of single species rather than ecological communities, the law actually promoted ecosystem management – especially when it came to a wide-ranging animal like the grizzly bear. The recovery zones established for the grizzly bear aggregated federal, state, tribal, and private lands and engendered the idea of the Greater Yellowstone Ecosystem and the Northern Continental Divide Ecosystem. As a variety of land managers came together to implement the grizzly bear recovery plan, the grizzly bear acquired the status of an “umbrella species,” meaning that to protect large areas of habitat for the grizzly would tend to protect many other species that shared the same habitat.⁵

A second important antecedent for ecosystem management was the formation of the Flathead River Basin Commission in the late 1970s. The organization brought together federal, state, tribal, and private stakeholders and raised awareness of issues with ecological and economic ramifications across the river basin. It was instrumental in forging a regional identity based on an ecological commons. The work of the commission eventually led to accords between the governor of Montana and the premier of British Columbia.

⁴ The quotation is from *Our Common Future* (1987), a report by the United Nation’s World Commission on Environment and Development, also known as the Brundtland Commission.

⁵ Marguerite H. Mahr, “Transboundary Conservation and the Yellowstone to Yukon Conservation Initiative,” in Prato and Fagre, eds., *Sustaining Rocky Mountain Landscapes*, 235.

In 1976, Glacier National Park was designated a biosphere reserve under the United Nation's Man and the Biosphere Program.⁶ A goal of this program was to establish a network of biosphere reserves that represented major biotic associations throughout the world. Each reserve was to conserve the integrity of biotic communities and their genetic diversity, provide for ecological and environmental research, and provide facilities for education and training. As Glacier's chief scientist Cliff Martinka explained,

Selection of reserves emphasized the need for large conservation areas with legal protection that could be used as benchmark comparisons for nearby manipulated areas. As such, biosphere reserves would ultimately help to provide an ecological rationale for sustained use of the world's natural resources. National parks were logical selections for reserves and the National Park Service has assumed a leadership role in implementing the program.⁷

Park superintendents explored the implications of the biosphere reserve designation for park management at the superintendents' conference held in Gatlinburg, Tennessee in 1984. Following that meeting, Director William Penn Mott, Jr., sent a memorandum to all superintendents on February 3, 1986, encouraging park managers to incorporate biosphere reserve concepts into park plans.⁸

Superintendent Gilbert Lusk pushed the CCE as a framework for ecosystem management in the late 1980s. Finding that the grizzly bear recovery effort had prompted biologists to focus on the Northern Continental Divide recovery zone – an area that encompassed the national park, two national forests, and myriad state, tribal, and private lands, but no lands in Canada – Lusk argued that the logic of ecosystem management required land managers to broaden their horizons further. As superintendent of Big Bend National Park in Texas in the early 1980s, Lusk had had previous experience working with Mexican land managers and scientists on transnational resource issues. He became a strong advocate for closer cooperation with Waterton

⁶ According to Glacier National Park, *Statement for Management*, 1990, p. 5: "The designation recognized Glacier's conifer forests, alpine tundra, diverse biotic communities, and other unique environmental qualities and lent greater support and depth to the themes of preservation (to conserve for present and future human use the diversity and integrity of biotic communities, and to safeguard the genetic diversity of species), research, and education (to provide areas for ecological research including base line studies, both within and adjacent to Glacier) while also allowing for human use."

⁷ C. J. Martinka, "New Role for Science in National Parks," 372.

⁸ William P. Gregg, Jr., to Joseph L. Sax, July 25, 1986, Folder 16, Box 10, Central Files FY 1986, GNP Archives.

Lakes National Park and other Canadian interests as well as the park's neighbors in Montana.⁹ An employee described Lusk as a "new paradigm manager" who wanted to move beyond the traditional mindset of managing the park like an island besieged.¹⁰ Lusk planted intellectual seeds that would germinate over a decade later in the formation of the Crown of the Continent Managers Group, a consortium of representatives from more than twenty agencies in Montana, British Columbia, and Alberta. Following an initial workshop held in Cranbrook, British Columbia in 2001 (co-sponsored by Glacier and Waterton Lakes), the Crown Managers Group met annually and appointed a steering committee to identify ecosystem-based opportunities for collaboration.

Lusk saw public education as a key component of the shift to ecosystem management. One of Lusk's initiatives was to develop the Crown of the Continent Discovery Center, a joint Park Service and Forest Service facility and educational entity whose main purpose would be to compile past, present, and future scientific information on the ecosystem for public and private use.¹¹ While the discovery center failed to materialize, a different educational organization sprang up which had a similar mission. The Crown of the Continent Ecosystem Education Consortium was formed in 1994 for the purpose of: (1) promoting a sense of community and a comprehensive view of the landscape among citizens of the region, and (2) providing balanced educational leadership on emerging concepts of ecosystem stewardship, conservation biology, and ecosystem sustainability.¹²

While the new emphasis on interagency cooperation in the 1970s and 1980s was critical in laying a foundation for ecosystem management, Glacier National Park was taking other important steps to address internal threats to ecosystem integrity as well. The park's resource management plan of 1984 pointed in the direction of ecosystem management. Previous resource management plans had taken the form of a list of problems or threats, which would result in each item being addressed in isolation. It tended to make resource management reactive and problem-oriented rather than proactive and holistic. The new plan was formed around the idea of identifying "desired future conditions." Instead of anticipating future threats to the park, the authors of the plan

⁹ Charles C. Chester, *Conservation Across Borders: Biodiversity in an Interdependent World* (Washington: Island Press, 2006), 149, 169.

¹⁰ Joseph L. Sax and Robert B. Keiter, "Glacier National Park and Its Neighbors: A Twenty-Year Assessment of Regional Resource Management," *The George Wright Forum* 24, no. 1 (2007), 26.

¹¹ Dudley Lutton to Crown of the Continent Discovery Center Committee, October 19, 1992, enclosing Crown of the Continent Discovery Center Mission Statement, unprocessed superintendent's files, GNP Archives.

¹² Tony Prato, "Alleviating Multiple Threats to Protected Areas with Adaptive Ecosystem Management: The Case of Waterton-Glacier International Peace Park," *The George Wright Forum* 20, no. 4 (2003), 46.

focused on what was wrong with the ecosystem now and how it could be repaired. The goal was to get back to a naturally functioning ecosystem. “It made us look at other components,” Gary Gregory stated. “Air and water were two things that had largely been ignored. By looking at it this way we could really see where the real problems were and could start to put fiscal resources into solving those problems.”¹³

Glacier’s resource management plan of 1984 moved the park in the direction of systematic inventory and monitoring. Meanwhile, scientists in the Washington Office were laboring to develop an inventory and monitoring program at the national level that would get congressional backing. A 1987 planning document for this initiative declared, “It is the policy of the National Park Service to assemble baseline inventory data describing the natural resources under its stewardship, and to monitor those resources forever – to detect or predict changes that may require intervention, and to provide reference points to which comparisons with other, more altered parts of the home of mankind may be made.”¹⁴ One year later, Congress supported the Park Service initiative with a new line item in the budget for inventory and monitoring, and the Park Service established the Inventory and Monitoring (I&M) Program. The Washington Office put out a call for proposals, Glacier responded, and the Park Service approved the park’s I&M initiative, funding it at one of the highest levels in the national park system.¹⁵

Glacier’s seed money for inventory and monitoring went primarily to database development and procurement of geographical information system (GIS) hardware. All data on natural resources existing in park files were compiled and entered into the new database, and biogeographic attributes were included or added as these records allowed. Having the information in a database gave resource managers the ability to evaluate lists of vascular plants, amphibians, reptiles, fish, birds, and mammals in ways that had not been possible before. The inventory included a total of 1,440 native species and 138 exotic species. Only three species (one amphibian, two mammal) were known to be missing. Nearly 90 percent of the exotic species were in the vascular plant category.¹⁶

The park used its second year of I&M funding to launch a long-term resources monitoring program. The park adopted a plan for integrated biological monitoring at the landscape, community, and selected species population levels. Researchers established

¹³ Gregory interview.

¹⁴ Quoted in U.S. Department of the Interior, National Park Service, “Draft Standards and Guidelines for Natural Resources Inventorying and Monitoring,” December 1987, KEFJ 13605/N/012, Administrative History Files, Archives, Kenai Fjords National Park.

¹⁵ Glacier National Park, *Annual Report 1988*, typescript, pp. 16-17, copy provided by GNP Archives.

¹⁶ C. J. Martinka, “Conserving the Natural Integrity of Mountain Parks: Lessons from Glacier National Park, Montana,” *Oecologia Montana* 1 (1992): 43.

18 sample plots within the McDonald Lake drainage basin and took monthly measurements from June through September of species abundance for selected species of vascular plants, birds, and small mammals.¹⁷

In 1990, the park made a bid to participate in another major science initiative, the U.S. Global Change Research Program. This congressionally-funded interagency program was expected to draw participation from a wide array of agencies, with national parks taking a prominent role in hosting climate change research. When Glacier was selected to be a host park, Martinka recruited Dr. Daniel Fagre to head up the new program. The program was to involve cooperation with researchers from the University of Montana and the Forest Service's Intermountain Research Station, with a focus on developing models for predicting hydrological responses to global climate change at the regional level.¹⁸

At the end of 1990, Superintendent Lusk and the resource management staff put together a detailed proposal for an increase of \$1.5 million over the current level of base funding for resource management. The proposal dovetailed with revisions to the resource management plan, which divided the program into six groupings: (1) terrestrial animals, (2) terrestrial vegetation, (3) aquatic resources, (4) abiotic resources, (5) ecosystem processes, and (6) human-resource interactions. The proposal stated:

Glacier resource management activities are based on the concept that resource conservation depends upon our ability to manage resources within park boundaries and also on recognition of the fact that the park is not an island, and that we must coordinate our actions with those of adjacent land managers and owners. To this end, we place great emphasis on the concept of "ecosystem management," and are actively involved with resource planning processes on the local, state, federal, and international levels. Our ability to conserve Glacier's resources will be dependent upon our ability to work with our neighbors and influence their resource-affecting actions.¹⁹

Although Glacier did not get all of the funding increase it wanted in the fiscal year 1992 budget, its resource management program was now more robust than ever before in the

¹⁷ Glacier National Park, *Annual Report 1991*, typescript, p. 41, copy provided by GNP Archives.

¹⁸ Glacier National Park, *Annual Report 1991*, typescript, p. 41, copy provided by GNP Archives; Dan Fagre, interview by Theodore Catton, October 22, 2009.

¹⁹ Superintendent to Associate Director, January 14, 1991, enclosing Glacier National Park Proposed Resource Management Related Base Funding Increase, Folder 15, Box 11, Central Files FY 1991, GNP Archives.

park's history. Superintendent Lusk transferred responsibility for formal development and administration of the program from the Ranger Division to a new Division of Natural Resources. The division incorporated the former Science Division together with the park's external issues coordinator position and the new global change research position. The Ranger Division retained responsibility for backcountry trails and wilderness management, fire control, and vegetation rehabilitation. The Interpretation Division continued to cover cultural resource management.²⁰ Glacier now had no fewer than six research-grade scientists. The scientists' areas of research covered grizzly bear population and behavior monitoring, climate change effects on landscape ecology, biological inventory and monitoring techniques, GIS applications, and Glacier's native cutthroat population, among others.²¹

Yet despite the newfound strength in Glacier's science program, and despite the park superintendent's recent efforts toward ecosystem management, many outside the Park Service thought the park administration was not doing enough to implement science-based management or to reach across political boundaries. The most in-depth critique of Glacier's resource management came from law professors Joseph L. Sax and Robert B. Keiter, whose 57-page report in *Ecology Law Quarterly* was noted in the previous chapter. The authors thought park officials were overly cautious in asserting park interests outside of the park. Park managers put too much emphasis on public opinion and the park's fund of "moral capital" when they ought to be using environmental laws to defend park resources. Sax and Keiter were dubious about the park's strategy for protection, which seemed to rest on building a public consensus when in some cases the park needed to take "strong, confrontational stands." The authors found a disjuncture between the park's short-term and long-term goals.

In the short-term, the park is trying to push development back from its borders and to create a sort of low intensity use, or compatible use, buffer zone around the park....In the long-term, Glacier hopes to bring about a commitment to regional land management in which, for example, the river basin rather than traditional boundaries will be the focus for decisionmaking, and the main substantive goals will be maintaining genetic integrity and biological diversity....Our field work has left us with the sense that Glacier is feeling its

²⁰ Glacier National Park, *Annual Report 1992*, typescript, p. 41, copy provided by GNP Archives.

²¹ Superintendent to Abby Miller, Division of Natural Sciences, June 12, 1992, with enclosures, unprocessed central files, GNP Archives.

way intuitively – groping, to put it more bluntly – as to both of these goals, and that it has not yet come to terms with all the forces at work on the park.²²

Similar critiques were aimed at other national parks and land managers. Alston Chase lambasted the Park Service for misusing science in his popular book, *Playing God in Yellowstone: The Destruction of America's First National Park*. Ecologist Karl Hess, Jr. offered another harsh critique in *Rocky Times in Rocky Mountain National Park: An Unnatural History*.²³ From Yellowstone to the Everglades, from the old-growth forests of the Pacific Northwest to the Great Smoky Mountains of Tennessee and North Carolina, federal land managers were faulted for not moving fast enough to adopt an ecosystem perspective, or for lacking the necessary foundation of ecological research to do so. And the most consequential criticism was yet to come. In 1992, the National Academy of Science issued a report, *Science and the National Parks*, a reprise of its earlier critique in 1963. The National Academy of Science report led to a radical proposal to take all research-grade biologists out of the NPS and place them with other federal biologists in a new agency called the National Biological Survey (NBS). Without a federal land management system of its own, proponents of this reform argued, the NBS would be able to deliver scientifically objective research for all federal land managers, thereby facilitating a shift to ecosystem management across political boundaries.²⁴

This reform measure found a champion in Secretary of the Interior Bruce Babbitt, who, upon taking office in the spring of 1993, immediately made the initiative his own. In Babbitt's view, the NBS was to parallel the U.S. Geological Survey in its mission of collecting, analyzing, and disseminating scientific data without any entanglement in the regulatory and managerial responsibilities of its sister agencies in the Department of the Interior. Further, it would provide science to state and local governments and non-profit organizations. "NBS will provide the scientific knowledge America needs to balance the compatible goals of ecosystem protection and economic progress," Babbitt confidently predicted.²⁵

Congress authorized the NBS in the fall of 1993, but it funded the NBS mostly by reallocating moneys that would have gone to other agencies, including the Park Service.

²² Sax and Keiter, "Glacier National Park and Its Neighbors: A Study of Federal Interagency Relations," 225.

²³ Sellars, *Preserving Nature in the National Parks*, 274.

²⁴ *Ibid.*, 286-89.

²⁵ U.S. Department of the Interior, "Scientific Research to be Reorganized Under National Biological Survey at Interior Department," press release, 26 April 1993, <http://www.bio.net/bionet/mn/bioforum/1993-April/004632.html> <March 12, 2010>; National Research Council, *A Biological Survey for the Nation* (Washington, D.C.: National Academy Press, 1993), vii.

Babbitt hoped that the NBS would rise above turf battles that had always hampered cooperative efforts between land management agencies. The NBS was hobbled from the start, however, by resistance from those very same agencies, which had to give up their biologists, and by inadequate funding. Furthermore, many landowners assumed that the new agency would infringe on their private property rights, and the Republicans in Congress agreed. In fact, the Republican Party's campaign platform for the midterm election, its vaunted "Contract with America," specifically called for abolishment of the NBS. After a brief, tumultuous existence as an independent agency, the NBS became the Biological Research Division of the U.S. Geological Survey.²⁶

The rise and fall of the NBS created turmoil for Glacier's resource management program that lingered on for many years. When the NBS was being formed it was unclear how many of Glacier's scientists would be transferred to the new organization. The park administration and most of the scientists resisted the transfer, so there was much anxious back and forth about who would need to change employers. When the transfer occurred, the park lost about eight full-time-equivalent positions. The park had made a calculated gamble to build up its scientific research capacity at the expense of acquiring more resource management positions and as a result it seemed to be especially hard hit by the reorganization. The damage was somewhat mitigated by the fact that all of the scientists remained duty-stationed at West Glacier after the transfer to NBS and continued to work primarily on park-oriented research. However, the park administration no longer had much sway in directing these scientists to do research outside of their own chosen fields of interest, and in any case it was never clear how long the beleaguered NBS would maintain its "park field station" at West Glacier. Even after the NBS folded and the former park scientists appeared to find a more permanent home in the USGS, the Park Service and the Geological Survey squabbled over how to share costs and services. As time passed, the NPS increasingly balked at paying what it perceived to be excessively high overhead rates charged by its sister agency.²⁷

The creation of the NBS proved to be no panacea for overcoming obstacles to ecosystem management, but neither did it turn into the crippling blow to park science that

²⁶ Sellars, *Preserving Nature in the National Parks*, 188-89. Background on the NBS is also taken from Diane L. Krahe's draft administrative history of the CESU network.

²⁷ In 1994, research-grade scientists in the NPS were located at 12 cooperative park studies units, 5 university field stations, 2 university research centers and 18 park field stations. Glacier was included in the last category. The park field station in Glacier reported to a research center in Fort Collins, Colorado, which was itself transferred from the Fish and Wildlife Service to the NBS. (Fagre interview. Also see Cliff Martinka to Superintendent, November 1, 1994, enclosing Administrator at INPS to J. Thiebaud, October 27, 1994, Central Files FY 1995, GNP Archives.)

some had feared. Whether the separation between park managers and scientific research in the park represented an improvement was still debated several years later.²⁸



5.2 Grizzly Bear Recovery

The interagency effort to recover the grizzly bear was a cornerstone of ecosystem management for Glacier. In the last decade of the twentieth century and the first decade of the new century the recovery effort continued to focus attention on the CCE or “Greater Glacier Ecosystem” as it was sometimes termed. The *Grizzly Bear Recovery Plan* defined six recovery zones for the grizzly bear, the largest of which it defined as the Northern Continental Divide Ecosystem (NCDE). In the revised recovery plan of 1993 the boundary of the NCDE was tightened up so as to exclude most privately owned lands. Glacier National Park, together with the Bob Marshall, Great Bear, and Scapegoat wilderness areas, formed the core of the NCDE, while additional lands on the Flathead, Lewis and Clark, Helena, Kootenai, and Lolo national forests and the Blackfeet and Flathead Indian reservations, together with BLM and state lands, made up the periphery. The entire area was divided into 23 Bear Management Units (BMUs) and a grizzly bear population estimate was attached to each BMU. The several land managers came together in the Interagency Grizzly Bear Committee (IGBC), and more specifically in the NCDE Subcommittee, to coordinate efforts.²⁹

The IGBC directed the NCDE Subcommittee to develop a conservation strategy that would stand up once the grizzly bear was considered “recovered” or formally removed from listing under the Endangered Species Act. The working paper, titled

²⁸ Potter interview; Fagre interview. For details of how the NPS and the NBS forged a new working partnership, see Cliff Martinka to Superintendent, November 1, 1994, enclosing Administrator at INPS to J. Thiebaud, October 27, 1994, and Superintendent to Cliff Martinka, November 8, 1994, Central Files FY 1995, GNP Archives.

²⁹ Kendall interview; U.S. Fish and Wildlife Service, *Grizzly Bear Recovery Plan*, rev. ed., prepared by Christopher Servheen (Missoula, Montana: U.S. Fish and Wildlife Service, 1993).

“Conservation Strategy for the Grizzly Bear in the Northern Continental Divide Ecosystem,” essentially took the concept of a hierarchy of management situations (MS 1, MS 2, and MS 3), which had been adopted in the IGBC Guidelines, and integrated it with the various agencies’ own resource management plans. A key element in the NCDE conservation strategy was the Cumulative Effects Model, which was intended to analyze cumulative effects on grizzly bear habitat, disturbance, and mortality for each BMU. Disturbance in this context referred to effects of human activities on grizzly bear habitat. The modeling effort helped land managers to integrate grizzly bear recovery with other land use demands. As such, it was particularly relevant for the Forest Service with its multiple-use-oriented directives. Developed by the Flathead National Forest, the Cumulative Effects Model sought to measure and evaluate four types of disturbance: roads, trails, point activities, and dispersed activities.³⁰

While the Flathead National Forest took the lead in grappling with the long-term consequences for habitat management, Glacier National Park remained concerned about habitat fragmentation in areas near the park. Scientific research had established the fact that the grizzly bear population in the park could not be sustained in isolation. Although bear mortality in the park had more or less stabilized at an acceptable level, virtually all grizzly bears in the park ranged outside of the park at various times and were susceptible to higher mortality rates in those peripheral areas. Without proper conservation, those peripheral areas would act like population sinks and take more bears out of the population than could be replaced through natural reproduction. Habitat fragmentation around the periphery of the NCDE also threatened to inhibit grizzly bear movements. The long term viability of the park’s grizzly bears depended on maintaining secure habitat linkages so that the park’s population would not become isolated.³¹

Superintendent Lusk insisted that new road development on national forest lands was particularly threatening to the NCDE grizzly bear population. When the Flathead National Forest released a draft EIS on its Open Road Density Standards, the park commented that the proposed limit of one mile of road per square mile in MS 1 habitat

³⁰ NCDE Subcommittee, “Preliminary Working Copy of the Conservation Strategy for the Grizzly Bear in the Northern Continental Divide Ecosystem,” December 1995, Central Files FY 1996, GNP Archives; Flathead National Forest, “Grizzly Bear Cumulative Effects Model,” no date, unprocessed RM files, GNP; Christopher Servheen, “The Grizzly Bear Recovery Program: Current Status and Future Considerations,” *Ursus* 10 (1998), 594.

³¹ Superintendent to Grizzly Bear Recovery Coordinator, October 21, 1992, unprocessed central files, GNP Archives.

areas should include both open and closed roads and that roads located on adjoining state and private lands should be factored into the total road density calculation.³²

As the NCDE Subcommittee worked through these issues, one question kept arising at the group's semi-annual meetings: how many grizzly bears were in the NCDE? No one could supply reliable population estimates for the lands they managed much less for the whole recovery area. Good population estimates were key to the effort, because they could point to population trends. Ultimately, good population estimates were needed to form the basis for finding that the population was recovered. As Christopher Servheen, the grizzly bear recovery coordinator, explained in a paper on the grizzly bear recovery program, to get the grizzly bear delisted would require the Fish and Wildlife Service to put forward a convincing case that three conditions had been met: first, that there was enough habitat to sustain a viable population; second, that mortality was at a level not to be threatening to the population; and third, that adequate regulatory mechanisms were in place to assure that habitats and populations would be monitored and managed in order to sustain the recovery. The middle piece in this three-part formula, an acceptable mortality rate, would be the hardest to obtain. Biologists could track the number of human-caused grizzly bear deaths fairly closely, but since they did not know the number of grizzly bears in the NCDE they could only guess at the mortality rate.³³

Since grizzly bear experts agreed that the NCDE population was most dense in Glacier, the pressure to obtain a reliable population estimate fell most directly on the Park Service. In the mid 1980s, the park experimented with using helicopter flights to obtain an accurate count of grizzly bears in the Apgar Mountains. Some environmentalists objected to the helicopter flights, saying that they constituted harassment of a threatened species and a violation of wilderness. A decade later, with that controversy behind them, park managers had no desire to attempt a bear census using traditional methods of trapping and baiting, drugging, collaring, ear tagging, lip tattooing, and aerial radio tracking. Such an effort would require handling large numbers of grizzly bears, putting both bears and researchers at risk. Furthermore, it might easily result in under counting, considering the dense vegetative cover that characterized so much of grizzly bear habitat in the NCDE. Fortunately, by the mid 1990s advances in DNA laboratory analysis

³² Superintendent to Grizzly Bear Recovery Coordinator, October 21, 1992, unprocessed central files, GNP Archives.

³³ Servheen, "The Grizzly Bear Recovery Program," 592.

created new possibilities for making a count of the grizzly bear population using DNA samples from bear sign.³⁴

DNA samples could be extracted from two types of bear sign: guard hairs (which include the hair follicle), and scat (which include DNA shed from the intestinal lining). As early as 1984, bear researcher Kate Kendall began collecting hair and scat samples found along the park trail system. Her original aim was to develop a safe, non-invasive, and relatively inexpensive method for estimating bear populations and population trends. Advances in DNA analysis in the early 1990s made it possible to differentiate grizzly bear and black bear DNA, to distinguish between sexes, and even to identify individuals. Kendall designed a pilot survey which demonstrated the feasibility of collecting adequate sample sizes of bear sign to obtain minimum population counts and population trends. In 1998, she obtained funding under the Natural Resource Preservation Program (NRPP) for a three-year study. The study involved some 30 seasonal biological technicians who collected DNA samples from numerous stations on trails around the park. Most of the stations were previously identified rub trees; others were baited hair traps. The latter were modeled on a bear DNA study made in the previous three years in Revelstoke National Park, British Columbia. The Glacier study initially focused on the one-million-acre area of the park, but it was later expanded to include another million acres outside the park.³⁵

The success of this study led to a wider study of the entire eight-million-acre NCDE. Planning for the large study began in 2003 and field sampling commenced the following year. In the first year, Kendall had 60 biological technicians involved in identifying and preparing rub trees and setting up hair traps throughout the vast study area. Wherever livestock were present, the hair traps had to be protected by a cattle exclusion fence. When the DNA sampling began, Kendall had some 240 biological technicians and hundreds of volunteers in the field each summer, as well as five year-round staff including one GIS specialist who coordinated the data entry. It was the largest non-invasive study of bears undertaken to date. At the end of the first summer of DNA sampling, the project had amassed approximately 34,000 bear hair samples from a total of 4,795 rub trees and 2,558 hair traps. With the help of DNA fingerprinting, researchers could not only estimate the number of bears represented in the sample, they could also detect their individual movements around the ecosystem. Kendall's team

³⁴ Chief Park Ranger to Director, July 12, 1996, with enclosure, Central Files FY 1996, GNP Archives.

³⁵ Chief Park Ranger to Director, July 12, 1996, with enclosure, Central Files FY 1996, GNP Archives; Acting Superintendent to USGS-BRD Park Oriented Biological Support Project Proposal Review Committee, October 28, 1999, with enclosure, Central Files FY 1999, GNP Archives; Kendall interview.

determined that 563 individual grizzly bears were in the sample. Using statistical models to estimate the number of bears not counted, the team arrived at an estimate of 765 grizzly bears in the NCDE.³⁶

The study had important implications for management. Overall, the results presented an encouraging picture. The population estimate was higher than previous estimates, and the methodology suggested that it was also more reliable than past estimates. One population estimate was not enough to indicate a population trend, but the results did contain hints that the population was growing. For example, the amount of genetic variation was consistent with an expanding population. Females were widely distributed. A larger population meant that mortality rates were lower than previously thought. Even so, female mortality rates were still too high for delisting according to criteria contained in the *Grizzly Bear Recovery Plan*. Future management efforts would need to focus on reducing the female mortality rate and monitoring population status. Another concern, looking ahead, was to maintain linkages between grizzly bear populations north and south of U.S. Highway 2. “It is likely,” bear biologists warned in a 2009 scientific paper, “that continued unmitigated development along the Highway 2 corridor will result in genetic fragmentation of the grizzly bear population in the NCDE.”³⁷

One long-range goal of the grizzly bear recovery effort was to restore genetic connectivity between the five separate grizzly bear populations remaining in the contiguous United States and grizzly bear populations in Canada. However, more than three decades after the bear’s listing under the Endangered Species Act, there was scant indication that grizzly bears were moving between recovery zones. As long as each population remained isolated, each population would be treated separately for purposes of assessing its recovery. By that yardstick, only two grizzly bear populations were close to recovery: Yellowstone’s and that of the NCDE.

In 2007, the Fish and Wildlife Service delisted the Yellowstone population, but the Greater Yellowstone Coalition challenged the decision and U.S. District Court Judge Donald Molloy ruled in 2009 that the delisting had been premature. Citing concerns that biologists had not taken into account uncertainties surrounding the effects of climate change on the bear’s habitat, the judge ordered the Obama administration to restore the

³⁶ U.S. Department of the Interior, U.S. Geological Survey, “New study estimates 765 grizzly bears reside in northwest Montana,” news release, September 16, 2008; Kendall interview.

³⁷ Katherine C. Kendall, Jeffrey B. Stetz, John Boulanger, Amy C. MacLeod, David Paetkau, and Gary C. White, “Demography and Genetic Structure of a Recovering Grizzly Bear Population,” *Journal of Wildlife Management* 73, no. 1 (2009), 15.

Yellowstone grizzly bear's threatened status.³⁸ Some bear biologists were disappointed by the ruling for they believed that the plan adopted for protection of the grizzly bear after delisting – the *Conservation Strategy for the Grizzly Bear in the Yellowstone Area* – actually provided better protection than the listing did. The *Conservation Strategy* froze development in the recovery area to a level that existed in 1998. For example, if the Forest Service wanted to develop a new campground, it had to remove a campground somewhere else. Ironically, the re-listing undid that powerful interagency agreement. As the controversy surrounding the Yellowstone grizzly bear population continued to unfold, it served as a bellwether for scientists and managers working on the recovery of the grizzly bear population in the NCDE.³⁹



5.3 Wolf Recovery

In some ways wolf recovery in Glacier National Park paralleled grizzly bear recovery. Like the grizzly bear, the wolf is a large, predatory animal with a need for expansive, wild habitat areas. Like the grizzly bear, the wolf was listed under the Endangered Species Act soon after the act's passage and its endangered status became a symbol not just of all endangered wildlife but of the tenuousness of wildness itself. As with the grizzly bear, park officials recognized that the wide-ranging wolf could not survive in the park alone – successful recovery had to involve interagency cooperation and an ecosystem management approach. And as with the grizzly bear, park officials were unequivocal in their view that the wolf belonged in the park.⁴⁰

But there was one major difference between the grizzly bear and the wolf, and that was that the wolf had been extirpated in Glacier. Apart from the occasional lone

³⁸ “Judge orders grizzly relisting,” (September 22, 2009), [Http://www.trib.com](http://www.trib.com) <March 17, 2010>.

³⁹ Kendall interview.

⁴⁰ Quoted in Karen R. Jones, *Wolf Mountains: A History of Wolves along the Great Divide* (Calgary: University of Calgary Press, 2002), 87. For a more detailed history of wolf recovery in Glacier, see Chapter 2, “Wolves in Glacier National Park,” 59-95.

wolf that visited the area from Canada, the species had been absent from the faunal assemblage in Glacier since the park's founding. As a result, the wolf's recovery involved many uncertainties such as how the population would spread, what effect it would have on prey species, and whether conflicts with livestock interests outside the park would come to thwart the entire effort. Another difference between the grizzly bear and the wolf was in the nature of the risk each animal posed to humans. The park focused enormous attention on the grizzly bear because grizzlies occasionally harmed park visitors. The park gave much less attention to the wolf because the wolf did not threaten park users; rather, it threatened livestock owners outside the park.⁴¹

Soon after the wolf was listed under the Endangered Species Act in 1973, park biologist Francis J. Singer prepared a research/management report on the history and status of the wolf in Glacier. Singer compiled historical records for a total of 97 wolf observations in the park area from 1910 to 1975. Singer reported that wolves were historically common in the area, that they were greatly reduced by 1900 and further reduced in the 1920s, and that solitary wolves were intermittently present in the North Fork valley from 1948 to 1973. Based on his own field work, he thought there were at least three to five wolves present in the park in the late winter of 1975.⁴²

On the basis of Singer's report and other estimates that placed the park's wolf population at 10 to 20 animals, Martinka prepared a plan for the protection of the wolf in Glacier. The plan called for monitoring the existing population, the wolf's habitat, and human activity in and adjacent to known wolf habitat areas – all of which was possible under existing field programs. In addition, the plan called for research to develop non-disruptive methods for more intensive monitoring and participation in interagency planning and management. These latter activities required supplemental funding. Martinka wanted the park to adopt the objective of restoring a natural and sustainable population of wolves in the park. As part of that effort, he proposed that the park take an active role in reintroducing wolves in Glacier and that it also take steps to reintroduce mountain caribou to its native habitat in the North Fork valley. Further, he suggested that

⁴¹ According to wolf researcher Robert R. Ream, the interagency Northern Rocky Mountain Wolf Recovery Team “spent about 90 percent of its time and energy resolving the issue of controlling wolves and prey on livestock” – an issue that only impinged on the park indirectly. See Bob Ream, “The Wolf Is At Our Door: Population Recovery in the Northern Rockies,” *Western Wildlands* 10, no. 2 (Summer 1984), 6.

⁴² Francis J. Singer, “The History and Status of Wolves in Northern Glacier National Park, Montana,” *Research/Management Series No. 2* (West Glacier: National Park Service, U.S. Department of the Interior, 1975), ii.

restoration of natural fire would indirectly lead to an increase in food sources for the wolf by improving habitat conditions for deer and elk.⁴³

Martinka recognized that wolf recovery would be contentious since the species had a long history of persecution in Montana and the West. Indeed, the wolf was still much maligned by the livestock industry as well as by many sport hunters. But the wolf also had strong, passionate public support as a symbol of the wild, and in the modern West this more favorable view of the wolf appeared to be growing. Martinka believed that changing public values would support an aggressive wolf recovery program. “The very real potential for gray wolf recovery represents one of the most significant ecological and political events of recent decades in the park,” he advised the superintendent in 1985.⁴⁴ He suggested that the park launch a public information program, perhaps in cooperation with other agencies, to help shape the coming political debate, which he fully expected to be sharp. “We should accept this as a challenge and learn as much as we can from the event,” he wrote to state wildlife biologist John Cada.⁴⁵

However, successive superintendents at Glacier in the 1970s and 1980s were not as eager as Martinka to get into a public relations battle over wolf recovery. Superintendent Iversen found the present wolf population in the park “unacceptably low” relative to the Park Service’s aim of preserving native species and natural processes, but he did not favor wolf reintroduction. Rather, he favored a more gradual and passive approach of waiting for breeding pairs of wolves to move into the area from Canada.⁴⁶ The park’s next two superintendents after Iversen took a similar tack. Haraden agreed with the regional director of the Fish and Wildlife Service “that natural recolonization from southwestern Canada is the proper course of action to recovery of the northern Rocky Mountain wolf in northwest Montana.”⁴⁷ Lusk wrote: “Recent research evidence points to patience as a necessary and fruitful posture in promoting a natural recovery.”⁴⁸

⁴³ C. J. Martinka, “A Plan to Protect and Preserve Northern Rocky Mountain Wolves in Glacier National Park” (draft), September 18, 1975, Folder 11, Box 252, GNP Administrative Records 1910-1984, GNP Archives. Also see his slightly revised “Planning Guidelines for the Conservation of Northern Rocky Mountain Wolves in Glacier National Park,” February 12, 1976, typescript, George C. Ruhle Library, GNP.

⁴⁴ Senior Scientist to Superintendent, January 31, 1985, Folder 2, Box 5, Central Files FY 1985, GNP Archives.

⁴⁵ Senior Scientist to Assistant Superintendent, August 8, 1985, and C. J. Martinka to John Cada, October 18, 1985, Folder 1, Box 15, Central Files FY 1985, GNP Archives.

⁴⁶ Superintendent to Director, August 18, 1980, Folder 9, Box 268, GNP Administrative Records 1910-1984, GNP Archives.

⁴⁷ Superintendent to Regional Director, November 20, 1985, Folder 1, Box 15, Central Files FY 1985, GNP Archives.

⁴⁸ Superintendent to Regional Director, January 27, 1987, Folder 13, Box 10, Central Files FY 1987, GNP Archives.

Funding for wolf research and management in Glacier was kept to a minimum for many years. The Fish and Wildlife Service obtained funds for research under Section 6 of the ESA. The Fish and Wildlife Service directed those funds to the State of Montana, which contracted with the Montana Cooperative Wildlife Research Unit. The School of Forestry at the University of Montana provided matching funds. Under these auspices the Wolf Ecology Project commenced research in 1973. University of Montana wildlife biology professor Robert R. Ream headed up a team composed mostly of students and volunteers. For the first five years of the study the Park Service would not permit researchers to capture and radio-collar wolves found within the park, in part because they were so rare and difficult to locate, so the Wolf Ecology Project focused on wolf packs located north of the border in British Columbia. In 1979, one female wolf was captured and radio-collared just six miles north of the park, which led park officials to anticipate that that particular wolf would range into the park. That development prompted Iversen to revise his position and permit the wolf researchers to trap wolves in the park. Gradually thereafter the Wolf Ecology Project followed the wolves into the park. The female wolf had a litter of seven pups in 1982, which were probably the progenitors of the first pack to take up residence in Glacier since well before 1973. Researchers christened the pack the Magic Pack because of its phantom movements.⁴⁹

In 1987, the Fish and Wildlife Service issued its long-awaited *Northern Rocky Mountain Wolf Recovery Plan*. The plan represented more than ten years of coordinated planning by the Fish and Wildlife Service, National Park Service, U.S. Forest Service, and Bureau of Land Management, together with the states of Montana and Idaho. The recovery team also included Bob Ream, Robert Turner of the National Audubon Society, and John Faulkner, a rancher. Following the lead of the grizzly bear recovery effort, the plan avoided the controversial nomenclature of “critical habitat” in favor of more generalized “recovery areas.” There were three recovery areas: northwest Montana, central Idaho, and the Greater Yellowstone Area. The plan divided each recovery area into a Zone I core area and a Zone II buffer area, and defined all land outside the recovery areas as Zone III.⁵⁰

⁴⁹ Supervisory Research Biologist to Chief Naturalist and Chief Ranger, April 26, 1979, and Philip R. Iversen to Dr. Robert Ream, October 13, 1979, Folder 13, Box 252, GNP Administrative Records 1910-1984, GNP Archives; Robert R. Ream, Michael W. Fairchild, Diane A. Boyd, and Daniel H. Pletscher, “Wolf Monitoring and Research in and Adjacent to Glacier National Park, Section 6 Final Report,” September 1987, typescript, George C. Ruhle Library, GNP; Jim Robbins, “Wolves Across the Border,” *Natural History* 95, no. 5, (May 1986), 11.

⁵⁰ U.S. Fish and Wildlife Service, *Northern Rocky Mountain Wolf Recovery Plan* (Denver: U.S. Fish and Wildlife Service, 1987), v.

With regard to the ongoing debate over whether wolf recovery should be assisted through translocation of wolves, the plan stated:

This plan emphasizes gray wolf recovery through natural processes (dispersal southward from western Canada) where possible. Where this is not possible because of distance from “seed” populations, translocation is the only known way to establish a population. Either philosophy necessitates conservation of suitable habitat in appropriate recovery areas. Establishing and maintaining wolf populations in three separate areas is believed necessary for recovery at this time. The probability of recovery through natural recruitment is high in northwestern Montana, moderate in Idaho, and remote in Yellowstone National Park.⁵¹

The plan went on to say that before any reintroduction would be attempted in Yellowstone the government would undertake an environmental impact study with full public involvement.

Once the recovery plan was in place, members of Congress began to take a greater interest in wolf management. The Wyoming delegation vociferously opposed reintroduction of wolves in Yellowstone, while Representative Wayne Owens of Utah introduced a bill that would have directed the secretary of the interior to move ahead on it. Two things happened that were consequential for Glacier. The Park Service began to fund wolf research independently from the Fish and Wildlife Service, and the Department of the Interior announced that it was temporarily shelving plans to study the reintroduction in Yellowstone. In the short run, the decision by Secretary of the Interior Donald P. Hodel diverted the Park Service’s wolf recovery efforts from Yellowstone to the Greater Glacier Ecosystem.⁵² The Park Service obligated \$100,000 per year for wolf research, monitoring, and management in fiscal years 1988, 1989, and 1990.⁵³

Superintendent Lusk worked with Flathead National Forest Supervisor Ed Brannon to prepare a draft memorandum of understanding to guide interagency efforts. After they laid the groundwork, both the Park Service and Forest Service regional offices got involved.⁵⁴ These efforts culminated in the formation of the Montana Wolf Working

⁵¹ U.S. Fish and Wildlife Service, *Northern Rocky Mountain Wolf Recovery Plan* (Denver: U.S. Fish and Wildlife Service, 1987), iv.

⁵² Elizabeth Raisbeck, National Audubon Society, et al. to Donald P. Hodel, November 3, 1987, Folder 2, Box 11, Central Files FY 1987, GNP Archives.

⁵³ Glacier National Park, “Briefing Statement, Gray Wolf Recovery in Glacier National Park,” June 1, 1993, unprocessed RM files, GNP Archives.

⁵⁴ John Mumma to Ed Brannon, January 6, 1989, Mumma to Gil Lusk, January 6, 1989, and Lusk to Mumma, February 14, 1989, Folder 12, Box 10, Central Files FY 1989, GNP Archives.

Group, composed of five federal agencies, the State of Montana, and the Confederated Salish and Kootenai Tribes and Blackfeet Nation. The working group implemented a more rigorous and comprehensive monitoring protocol based on a uniform “observation” or “reporting” card. The working group coordinated all wolf research, and the Wolf Ecology Project joined efforts with the Montana Department of Fish, Wildlife and Parks to study predator-prey relationships as well as wolf-mountain lion relationships in the North Fork area. Despite relative progress in Montana on the political front, however, the wolves themselves were making a slow comeback. By 1991, the working group identified five packs – three in the North Fork valley and two elsewhere – but mortality was high.⁵⁵

In 1991, the Department of the Interior reversed course and initiated an environmental impact study for the reintroduction of wolves in Yellowstone National Park. The administration’s budget included \$348,000 for wolf studies, including \$50,000 for ongoing wolf studies in Glacier. When Congress took up the appropriation bill, it transferred the entire amount to the Fish and Wildlife Service and the Montana working group was left scrambling for money to keep the research and monitoring effort in northwest Montana on track.⁵⁶ This signaled a shift in attention to Yellowstone that would persist through the decade. Wolves were released in both Yellowstone and central Idaho in January 1995.⁵⁷

The long-running Wolf Ecology Project ended its research in the North Fork valley in 1997. The park, in cooperation with the Fish and Wildlife Service, initiated another round of monitoring in the North Fork area in 2000 using a mix of ground surveys and aerial surveys. Much of the effort focused on two radio-collared wolves. The study revealed that the wolf population in the North Fork valley had showed a marked decline over the previous three years.⁵⁸

While the wolf population in the North Fork valley oscillated, managers considered the gray wolf to have re-established its range throughout the park, and wolf numbers did show a more promising trend over a wider area. Based on the establishment

⁵⁵ U.S. Fish and Wildlife Service, *Wolf Recovery in Montana: 1991 & 1992 Annual Reports of the Montana Interagency Wolf Working Group* (Washington: Government Printing Office, 1993), 1-4. The five federal agencies in the working group were NPS, Forest Service, Fish and Wildlife Service, BLM, and APHIS-Animal Damage Control.

⁵⁶ Director, National Park Service to Director, U.S. Fish and Wildlife Service, November 21, 1991, unprocessed central files, GNP Archives.

⁵⁷ Edward E. Bangs et al., “Status of gray wolf restoration in Montana, Idaho, and Wyoming,” *Wildlife Society Bulletin* 26, no. 4 (1998), 787.

⁵⁸ Meg Hahr et al., “A Summary of Gray Wolf Monitoring and Observations in Glacier National Park, Montana, 2000,” typescript in George C. Ruhle Library, GNP, pp. 1-6.

of other wolf packs in Montana, Idaho, and Wyoming, the federal government delisted the gray wolf for three months in 2008 (allowing the states to institute an experimental wolf hunt) and it delisted the animal again, this time in Montana and Idaho but not Wyoming, in 2009.⁵⁹ The State of Montana authorized a second wolf hunt in the fall of 2009 but in deference to Glacier it provided a quota of just two wolves in the North Fork valley. An additional three wolves were killed in the North Fork by poachers. Meanwhile, the wolf's status under the Endangered Species Act seesawed back and forth as U.S. District Court Judge Molloy ruled in 2010 that the delisting was out of compliance with the law, requiring that it be relisted, and Secretary of the Interior Ken Salazar decided in May 2011 to delist the species again in Montana and Idaho.⁶⁰



5.4 Vegetation Management

In August 1987, Sam Hofman, a Montana state senator, rancher, and member of the Gallatin County Weed Board, was dismayed to observe extensive patches of spotted knapweed growing alongside the Going-to-the-Sun Road. Stopping at headquarters to inquire what was being done about it, he learned that the Park Service was experimenting with biological controls while resisting the use of more potent chemical controls. Returning to his home near Manhattan, Montana, Hofman wrote to Secretary of the Interior Donald Hodel, "I am quite knowledgeable about weed control, and I feel quite sure that the Park Service does not fully realize the seriousness of their weed problem." Nothing short of chemical treatment would contain this invasive plant species, Hofman stated. He had recently inspected test plots near Butte where a single application of one-half pound of Tordon per acre had completely eradicated spotted knapweed while doing

⁵⁹ Karl Puckett, "Gray wolves delisted again," *Great Falls Tribune*, January 15, 2009.

⁶⁰ Chris Peterson, "Wolf hunt near Glacier draws debate," *Hungry Horse News*, November 11, 2009; Katharine Mozzone, "Gray Wolf to be Delisted in Montana," May 4, 2011, at <http://www.nbcmontana.com/news/27781179/detail.html> <May 12, 2011>.

minimal harm to native plants. “Anything that you could do to get the Park Service actively engaged in a good eradication program of these noxious weeds will benefit our Parks and the people who enjoy them,” Hofman advised the secretary.⁶¹

The change in weed control that commenced in the 1980s presents another facet in the park’s shift to ecosystem management. Hofman represented agricultural interests in Montana, which had a strong economic incentive to support aggressive measures for combating the spread of exotic plants like spotted knapweed. The Park Service, for its part, was no friend of exotic plants, but it was downright hostile toward introduced chemical control agents. The dire warning about DDT and other pesticides contained in Rachel Carson’s *Silent Spring* (1962) made a strong impression on Park Service culture in the environmental era. Twenty-five years after *Silent Spring*, Park Service resistance to the use of chemicals remained ingrained in the agency culture. Agricultural interests feared that if the Park Service would not play ball and consent to the use of chemical control measures, then spotted knapweed and other exotic plants would find a safe harbor in the park from which those weeds would threaten agricultural interests outside. By way of illustration, Hofman noted the consequences in the Missoula area where the city council, like Glacier National Park, refused to sanction chemical treatments. Around Missoula knapweed had spread from roadsides and railroad beds to cover entire hillsides and drainages. What Hofman desired was a united approach to weed control across the region.

Agricultural interests in Alberta shared this view. In 1986, Superintendent Lusk heard from the head of the Crop Protection Branch in the Alberta provincial government. Alberta had adopted a knapweed eradication program in 1975 and was virtually knapweed free. Alberta’s agricultural administrator complained that the park was failing to control knapweed infestations along the Chief Mountain International Highway in the northeast corner of the park. With the large number of tourists traveling between Glacier and Waterton Lakes National Park, this official feared that the infestations would spread north over the border and undermine Alberta’s eradication program.⁶²

Besides spotted knapweed, the spread of another exotic plant in Glacier, leafy spurge, also caused concern.⁶³ Leafy spurge was present in Big Prairie in the North Fork valley, evidently having arrived as seed in firefighting equipment flown in from North

⁶¹ Sam Hofman to Don Hodel, August 14, 1987, Folder 1, Box 11, Central Files FY 1987, GNP Archives.

⁶² M. K. Price to Gilbert Lusk, October 3, 1986, Folder 11, Box 11, Central Files FY 1986, GNP Archives.

⁶³ Spotted knapweed and leafy spurge received by far the most attention, but the park directed its limited weed control efforts in the 1970s and 1980s against other exotic plants, too, including Canada thistle, oxeye daisy, hawkweed, goatweed, tansy, and mullein. See Glacier National Park, *Exotic Vegetation Management Plan*, February 1991, typescript, p.8, George C. Ruhle Library, GNP.

Dakota more than a decade earlier. From its start along the airstrip, the noxious weed spread throughout the meadow area. The Flathead County Weed Control Board alleged that the noxious weed was dispersing from Big Prairie down the North Fork to other areas not previously affected. As with the spotted knapweed, agricultural interests pressed the Park Service to eradicate this weed with chemical spraying. Park officials refused. “Chemical eradication methods are impractical and inadvisable as they merely perpetuate the disturbed condition which allowed the spurge to invade the area in the first place,” wrote one resource manager. Park officials experimented with other control methods, including mowing and burning. The burn was conducted on August 6, 1978. This prescribed burn in a patch of leafy spurge predated the park’s first prescribed burn in a stand of forest by five years.⁶⁴

Although the Park Service strongly resisted use of chemical controls in this era, that did not mean it was indifferent to the spread of exotic plants. The Park Service had been drawing a sharp distinction between native and exotic species of plants since the appearance of *Fauna in the National Parks* in 1932, if not the National Park Service Act of 1916.⁶⁵ However, Park Service policy was to initiate a control program only when it was scientifically demonstrated that exotic species threatened native species. More specifically, Park Service policy called for control programs wherever the exotic species had a high impact on protected park resources and there was a reasonable chance for successful control. While Park Service policy acknowledged that noxious weeds could be a concern to adjacent landowners, the threat noxious weeds posed to agricultural crops did not directly impinge on park management objectives.⁶⁶

But in the 1980s the pressure from agricultural interests became too great to ignore. If the park wanted cooperation from its neighbors on such matters as watershed protection and a ban on nearby oil and gas leasing, it could not afford to alienate its neighbors over this other resource management issue. Moreover, the park’s own roadside surveys and field research began to demonstrate that spotted knapweed and leafy spurge – and to a lesser degree, numerous other exotic plants – were making significant inroads in the park. Resource management specialist David Lange and GIS specialist Carl Key

⁶⁴ Phillip R. Iversen to Henry Robinson, March 23, 1979, Folder 7, Box 263, GNP Administrative Records 1910-1984, GNP Archives; Resource Management Ranger Robert S. Hall to Chief Park Ranger, August 11, 1980, and Resource Management Ranger Dan Taylor, “Preliminary Observations of the Effect of Autumn Burning on Leafy Spurge, *EUPHORBIA ESULA*, on Big Prairie,” Folder 10, Box 256, GNP Administrative Records 1910-1984, GNP Archives. Quotation by Hall.

⁶⁵ Linda Drees, “A Retrospective on NPS invasive species policy and management,” *Park Science* 22, no. 2 (Fall 2004), 22.

⁶⁶ Glacier National Park, “Briefing Statement, Exotic Plant Control,” January 10, 1982, George C. Ruhle Library, GNP.

conducted an exotic plant survey of all major roadsides in the park from 1982 to 1984. Park staff made additional surveys of ornamental plants located around old homestead sites, summer cabins, and government buildings, and exotic plants found along backcountry trails and the edge of the Flathead River. The surveys found more varieties of exotic species present than was previously thought. From 1984 to 1987, the park conducted a study of spotted knapweed infestations in native fescue grasslands located near St. Mary. The findings convinced park managers that spotted knapweed was not restricted to disturbed areas along roadsides. Spotted knapweed was capable of colonizing pristine fescue grasslands adjacent to these disturbed areas, displacing native plants where the native species were already established. Besides giving more weight to concerns that the park was becoming a seed bank for the spread of noxious weeds to agricultural lands located outside the park, these findings also demonstrated that exotic plants threatened to displace native species in their own habitat inside the park.⁶⁷

Lange took the lead in developing a vegetation management program for Glacier. In 1985, he prepared draft plans for the control of the two main threats, spotted knapweed and leafy spurge, and in the late 1980s he prepared Glacier's *Exotic Vegetation Management Plan*, which was put through internal and public review and finalized in 1991. All of these plans embraced the environmentally-sensitive control strategy known as Integrated Pest Management (IPM), which the Park Service formally adopted in 1980. IPM sought to integrate use of chemical pesticides with more benign controls and enhanced understanding of pest lifecycles, so that use of chemical treatments would be more circumspect, targeted, and effective. It was premised on keeping pests at acceptable levels rather than completely eradicating them. As more and more federal, state, and county agencies adopted IPM, differences between weed control programs inside and outside the park gradually became less stark. Park managers eventually lowered their guard against the use of chemicals inside the park as those other agencies developed a more judicious use of chemicals outside the park.

Spraying of spotted knapweed along roadsides in Glacier followed approval of the *Exotic Vegetation Management Plan* and completion of two environmental assessments (one for herbicide use on each side of the divide).⁶⁸ The Park Service contracted with the Forest Service for a crew, which was deployed initially on the east side in 1993. A few years later, the park contracted with county agents and expanded the effort. By the end of

⁶⁷ Dawn LaFleur, interview by Theodore Catton, October 20, 2009; Glacier National Park, *Exotic Vegetation Management Plan*, February 1991, typescript, p.7, George C. Ruhle Library, GNP; Robin W. Tyser and Carl H. Key, "Spotted Knapweed in Natural Area Fescue Grasslands: An Ecological Assessment," *Northwest Science* 62, no. 4 (1988), 151-155.

⁶⁸ "Lusk OKs Park weed plan," *Hungry Horse News*, June 17, 1993.

the decade, the park ran its own weed control crews, one based in St. Mary and the other in West Glacier. Then, in 2000, the labor source for weed control took yet another turn as Glacier bid to become a host park for an Exotic Plant Management Team (EPMT). At this time, the Park Service established several such teams across the nation. The idea behind the EPMT was “to provide rapid response and management of invasive plant species at clusters of parks.” As a result of this new organization, a Northern Rocky Mountain EPMT was created to serve a four-state area including Montana, Idaho, Utah, and Wyoming. This team was based in Yellowstone and had three satellite crews, one of which was housed in Glacier. The three-member EPMT satellite team was usually dispatched to smaller units such as Grant-Kohrs Ranch National Historic Site.⁶⁹

The results of all this labor and herbicide use were not obvious to those who lived and worked in the park year after year, but they were striking to anyone with an eye for knapweed who saw the park only occasionally – especially when the knapweed’s small purple flowers bloomed in mid-summer. As the park’s IPM biologist, Dawn LaFleur said, “Overall, what I’ve been hearing from weed experts who have been looking at roadsides in the park for some twenty years is that it’s much better than it was. It used to be purple along the roadsides when the park wasn’t doing anything and they’re amazed at how far we’ve come.”⁷⁰

Under the park’s exotic vegetation management program, first Lange and then LaFleur, along with other park staff, monitored sample vegetation plots to assess changes in the relative cover, diversity, and production of exotic and native plants. Monitoring protocols aimed at detecting when the presence of an undesirable species reached so-called “injury” and “action” levels. According to IPM guidelines, the “injury level” defined the size of the pest population that would cause unacceptable damage to park resources, while the “action level” defined the size of the pest population that would trigger management action in order to prevent the population from reaching the injury level. Besides monitoring sample vegetation plots, park staff monitored control areas to observe how natives responded when exotics were knocked out. The effects were not easy to assess, as drought cycles and other factors led to inconsistent results.⁷¹

Following its overall success with the spotted knapweed, the park’s IPM program began to target other weeds that were listed on the state’s noxious weeds list, treating some by herbicide and some by hand-pulling. Prior to any herbicide treatment the park’s

⁶⁹ National Park Service, “Request for Proposals for NPS Exotic Plant Management Teams,” undated, Central Files FY 1999, GNP Archives; LaFleur interview.

⁷⁰ LaFleur interview.

⁷¹ Glacier National Park, *Exotic Vegetation Management Plan*, February 1991, typescript, p. 14, George C. Ruhle Library, GNP; LaFleur interview.

IPM biologist, Dawn LaFleur, developed a proposal for review by the regional office. For certain restricted chemical products or for areas that contained threatened or endangered species, the proposal was reviewed by the Washington Office. LaFleur maintained records on all use of chemical agents in the park – even bear spray. In 2009, LaFleur was in the process of updating the exotic vegetation management plan. Two changes in the IPM program that LaFleur anticipated in the near future were increased use of biological control agents and more use of pesticides in the backcountry.⁷²

By the first decade of the twenty-first century, exotic vegetation management in Glacier had acquired a relatively high profile within the park's resource management program. Like grizzly bear and wolf management, it showed the influence of ecosystem management thinking. Park officials now recognized that no areas in the park were beyond reach of invading exotic plants. Indeed, with two million visitors setting foot in the park each summer, many of whom came from foreign countries, Glacier was more exposed to exotic seed sources than were nearby agricultural lands. Park officials also saw the importance of cooperating with park neighbors. Resource management staff participated with state and county weed control agents and private landowners in cooperative weed management areas located on the east and west sides of the park, and with provincial weed control agents in a similarly designated area in southwest Alberta. The park joined with the Bureau of Indian Affairs and the Blackfoot Nation in a cooperative agreement to coordinate noxious weed control. In 2008, Glacier joined an expanding group of federal, state, and private partners known as the Rocky Mountain Front Weed Roundtable. These various partnerships served as means for exchanging information and for pooling resources. Glacier's plant ecologists also worked hand-in-hand with Forest Service personnel on Burn Area Emergency Response (BAER) teams following forest fires. A major focus of BAER planning and implementation was to check the spread of exotic weeds in newly-bulldozed fire lines. These efforts had their origin in the experimentation and research activity that followed the Red Bench Fire in 1988. Ecological studies in connection with the Red Bench Fire revealed how fire lines and burn areas were unusually susceptible to invasions by exotic plants. Those studies led to significant reduction in the use of fire lines as well as more aggressive rehabilitation efforts following fire suppression. Rehabilitation techniques included bringing forest duff from adjacent areas and reseeding. BAER teams, which had the singular advantage of tapping into fire money, made extensive use of these rehabilitation

⁷² LaFleur interview.

techniques. While focused on re-vegetation, an important aim of BAER plans was to prevent disturbed areas from turning into vectors for the spread of exotic plants.⁷³

Re-vegetation efforts also came into play in the rehabilitation of the Going-to-the-Sun Road. As the enormous reconstruction project moved through various stages of planning in the 1980s, resource management specialist Lange saw the importance of including re-vegetation of disturbed areas in the construction zone as an integral component of the construction work. The Federal Highway Administration (FHWA) agreed to include funding for re-vegetation as part of the \$50 million construction package. With the FHWA's funding support, Lange was able to hire Joyce Lapp to serve as the park's first vegetation management specialist. Lapp built an ambitious re-vegetation program around the plan of taking native seedlings from a given construction zone along the Going-to-the-Sun Road corridor, growing them in a plant nursery at West Glacier, and replanting them once the construction zone was no longer active. The entire plant nursery was constructed with FHWA project funds. The plant nursery also propagated plants for use in other disturbed areas.⁷⁴

As a horticulturalist, Lapp took a keen interest in monitoring the health of individual plants as well as building a successful program. "The Going-to-the-Sun Road rehabilitation has been a career for several of us," Lapp stated in 2009. "There are trees out there that I collected as seed that are now as tall as I am." After twenty-three years, the re-vegetation project spanned some sixty miles of roadway. Moving in tandem with the road reconstruction, the re-vegetation effort started on the west side, then moved to the east side, and finally entered the alpine zone around Logan Pass. As environmental conditions varied greatly for each section, different challenges arose. Compiling a careful and systematic record as they went, the resource managers prepared yearly reports on their data. After twenty years, those aging reports were soon to prove doubly useful as each section of the road came due for rehabilitation again. As Lapp suggested, the reports would provide a "detailed recipe on how to reseed those areas the next time." Indeed, Glacier's monitoring program was so robust, and its re-vegetation program so

⁷³ LaFleur interview; Joyce Lapp, interview by Theodore Catton, October 21, 2009. Some BAER plans were interagency and some were not, depending on the location of the burn. Although BAER plans made allowances for the different purposes of national parks and national forests, the prescriptions they offered bore a striking resemblance to one another. Compare, for example, NPS Intermountain Burned Area Emergency Response Team, *Middle Fork and Rampage Complexes, July-September 2003, Burned Area Emergency Stabilization and Rehabilitation Plan, Glacier National Park, Montana*, and Interagency Burned Area Emergency Response Team, *Wedge Canyon Fire, July-August 2003, Burned Area Emergency Stabilization and Rehabilitation Plan, Flathead National Forest & Glacier National Park, Montana*, reports provided to author by Joyce Lapp.

⁷⁴ Superintendent to Associate Regional Director, April 28, 1992, unprocessed central files, GNP Archives; Lapp interview.

successful, that Lapp was repeatedly detailed to other parks to help them develop a similar funding package with the FHWA and prepare a re-vegetation plan. The plant nursery at West Glacier, specializing in the propagation of high altitude wild plants from specific genetic stocks, became a regional nursery, growing plants for Yellowstone, Waterton Lakes, Crater Lake, and the Bob Marshall Wilderness Area.⁷⁵

One native species of growing concern was the whitebark pine. An extensive survey of whitebark pine stands in the mid 1990s revealed that approximately three-quarters of trees were infected by white pine blister rust and the forest-tree disease had caused about one-quarter crown loss. Destruction of whitebark pine may have significant ramifications, since its cone seeds are an important food source for wildlife, including grizzly bears. In addition, whitebark pine forest occurs near treeline, where the shade of the forest canopy affects rate of snow accumulation and snowmelt. In the late 1990s, resource managers began to experiment with seed collection and propagation for both whitebark pine and limber pine to counter the effects of blister rust. The aim was to target stands with relatively low incidence of the disease and propagate rust-resistant stock. The program was carried out under cooperative agreements with the Forest Service, the Blackfeet Nation, and Waterton Lakes National Park. Seedlings were mostly propagated at the Forest Service's Coeur d'Alene nursery with some grown at Glacier's nursery as well. Planting and monitoring of seedlings focused on West Flattop Mountain and Dutch Ridge in Glacier as well as sites on the Blackfeet Reservation and in Waterton Lakes National Park. After nearly a decade and a half of effort, resource managers were obtaining somewhat heartening results. Meanwhile, they continued to expand their efforts from year to year and to make various refinements in monitoring protocols.⁷⁶

Vegetation management – and more specifically, the control of noxious weeds – also embraced the perennial problem of grazing trespass, since trespassing livestock spread exotic plants by bringing seeds into the area in both their hooves and their dung. Resource damage from grazing trespass went beyond the spread of exotic plants; livestock also competed with wildlife for forage. Resource managers estimated that livestock consumed about 175,000 pounds of grass inside the park in 1984, based on a total of 4,394 livestock-days recorded that year. Trespass cattle also wore trails along

⁷⁵ Lapp interview.

⁷⁶ Kristopher Peterson, "Whitebark Pine Restoration in Glacier National Park: A GIS-Based Fire Management Strategy," unpublished student paper, December 13, 1998, copy provided by Joyce Lapp; Ken Gibson, "Mountain Pine Beetle Conditions in Whitebark Pine Stands in the Greater Yellowstone Ecosystem, 2006," in USDA Forest Service, *Forest Health Protection*, No. 06-03 (February 2006), 5; Anonymous, "History of Whitebark Pine and White Pine Blister Rust Management in Glacier National Park," updated August 2010, copy provided by Joyce Lapp; Lapp interview.

streambeds that increased sedimentation, reduced water quality, and impaired fish habitat. One environmental assessment summarized the adverse effects of grazing trespass as follows: “Use of Park lands by livestock alters the natural environment, reduces the natural carrying-capacity of native wildlife, reduces visitor safety, and violates the National Park Service’s mandate to maintain those lands as a naturally functioning ecosystem.”⁷⁷

Glacier’s grazing trespass problem was most pronounced along the border with the Blackfeet Reservation. For many years, tribally-owned grazing lands on the west edge of the reservation were consolidated into approximately eight to ten leases which were leased to individual tribal members. Often those leases were subleased to the actual livestock operator. Although practices varied over time and from lease to lease, livestock operators frequently allowed their cattle to range into the park so as to reduce grazing pressure on the lease itself. When park managers objected, the Blackfeet Nation insisted that tribal members had rights of access to those lands under the land cession agreement of 1895. The Blackfeet also renewed claims that the boundary between the park and the reservation was in the wrong place due to federal officials’ misreading of the 1895 proceedings. Since the grazing trespass issue was inextricably bound up with unresolved questions over tribal use rights in the ceded strip as well as the location of the boundary, park officials often found that addressing the trespass problem was more trouble than it was worth.⁷⁸

In the late 1970s, Glacier proposed to erect a post and wire fence along the boundary to keep out livestock. Plans called for a fence consisting of three to four strands of barbwire attached to wood or metal posts. Gates at intervals would allow access for fire control and other management purposes and would remain open to improve wildlife passage at the end of each grazing season. Apparently at least two sections of fence were completed in the vicinity of Cut Bank Creek and St. Mary when progress was halted due to objections by the Blackfeet. For a few years, park officials and tribal representatives sought alternative solutions, including implementation of a range rider program, but they were not successful. In the fall of 1985, the Park Service announced that it would resume fence construction. But one year later, Senator John Melcher (D-MT) denounced the program on the floor of the Senate, saying that to put up a fence would be “to make large zoos” out of the national parks. Melcher wanted a halt

⁷⁷ Regional Director to Governor, February 19, 1986, enclosing Glacier National Park, “Environmental Assessment, Construction of Fence Along Selected Portions of Boundary – Glacier National Park,” undated, copy provided by Dawn LaFleur.

⁷⁸ Potter interview; Sigler interview.

to the project until the Park Service and the Blackfeet had an agreement. The next day, the Park Service stopped work on the fencing project.⁷⁹

The standoff over grazing trespass continued. From time to time the Park Service increased pressure on the tribe or on the lease holders. In the early 2000s, a grazing trespass case was brought to court. The judge fined the lease holder a paltry five dollars, signaling to the Park Service that it should not look to the courts to resolve the issue. Various stakeholders put pressure on the Park Service to find a negotiated or consensus-based solution. But the Park Service and the Blackfeet made little progress toward reaching an agreement on the issue.⁸⁰ Finally, in 2009, the tribe took some unilateral steps that gave park officials hope. At the urging of its own fisheries biologist, the tribe built a fence to keep cattle out of Kennedy Creek. The purpose of the fence was to protect stream habitat for bull trout. It was not a boundary fence, but it served to protect natural resources upstream in the park. About the same time, the Blackfeet Tribal Business Council began weighing the possibility of retiring one of the leases bordering the park. Previously, it had retired leases in the Boulder Creek area in order to protect elk habitat. Park officials read these actions as an indication that the Blackfeet wanted to eliminate trespass cattle in the park – on terms that would concede nothing relative to the location of the boundary.⁸¹



5.5 The Badger-Two Medicine Area

While the park and the Blackfeet Nation frequently butted heads over grazing issues, they tended to be aligned in their objections to oil and gas drilling on the Lewis

⁷⁹ Regional Director to Governor, February 19, 1986, enclosing Glacier National Park, “Environmental Assessment, Construction of Fence Along Selected Portions of Boundary – Glacier National Park,” undated, Robert C. Haraden to Earl Old Person, October 24, 1985, Old Person to Haraden, November 14, 1985, Haraden to Old Person, November 26, 1985, Glacier National Park, “Briefing Statement, Cattle Trespass,” undated, and Melcher speech in *Congressional Record*, September 16, 1986, copies provided by Dawn LaFleur.

⁸⁰ Tamar Losleben, “Livestock Trespass in Glacier National Park: Crossing the Great Divide,” unpublished paper, August 1, 2003, copy provided by Dawn LaFleur.

⁸¹ Potter interview; LaFleur interview.

and Clark National Forest. Their attention focused on the Badger-Two Medicine Area. The park's interest in this area centered on its value as grizzly bear habitat and as a buffer area for park wilderness. Many traditional Blackfeet held that the mountainous terrain of the Badger-Two Medicine was sacred to Blackfeet culture. Blackfeet religious practitioners used the area for vision quests, sweat lodges, fasts, and other ceremonies that were incompatible with oil and gas exploration and development. Moreover, the Badger-Two Medicine area fell within the same ceded strip that the east side of Glacier had come from, and as such it carried the same emotional significance relative to tribal sovereignty. The Blackfeet claimed special access rights to the area under the agreement of 1895; therefore, when oil and gas leasing arrangements called for temporary restrictions on public access, the Blackfeet saw the leases as a threat to their sovereignty.⁸²

Blackfeet traditionalists and wilderness advocates came together in the mid 1980s to form the Glacier-Two Medicine Alliance. This group proposed wilderness designation for the area. However, many Blackfeet were leery of wilderness designation and preferred to oppose the leases on religious grounds under the American Indian Religious Freedom Act. Their movement to win protection for the area gained considerable momentum in 1993 when the Clinton administration decided to suspend well approvals pending a study of the area's cultural significance to the Blackfeet. The study, completed in 1996, recommended that a portion of the area should be designated a Traditional Cultural District (TCD) under the National Historic Preservation Act. After a lengthy consultative process, in 2002 the TCD was finally determined eligible for listing in the National Register; however, the Keeper of the National Register recommended that the primary well site known as the Hall Creek lease should be excluded from the TCD. The Blackfeet were ambivalent whether to except the smaller TCD area or continue to push for protection of a larger area. So the process of determining a boundary for the proposed TCD continued.⁸³

While the Blackfeet Nation emerged as a key player in the conflict over how to manage the Badger-Two Medicine, new leadership in the Forest Service played no small part in forestalling oil and gas exploration as well. In the mid 1990s, the Forest Service's new chief forester, Jack Ward Thomas, resisted pressure to impose a decision on oil and

⁸² Gilbert Lusk, "Glacier National Park, Policy Statement," April 29, 1988, File "Native American Relations," Cultural Resource Specialist Office Files, GNP; James Bruggers, "Forest Service Steps on Blackfeet," *Progressive* 51 (April 1987), 14; Greg Bechle, "A Shortage of Solitude," *Progressive* 54 (April 1990), 22.

⁸³ Joseph L. Sax and Robert B. Keiter, "The Realities of Regional Resource Management: Glacier National Park and Its Neighbors Revisited," *Ecology Law Quarterly* 33, no. 2 (2006), 273.

gas leasing from Washington, and the Lewis and Clark National Forest's new forest supervisor, Gloria Flora, took the revolutionary step of announcing that no lands along the Rocky Mountain Front (including the Badger-Two Medicine area) would be offered for lease for a period of ten to fifteen years. Flora's decision came in response to growing evidence that public opinion was largely in favor of protecting natural and scenic values along the whole northern Rocky Mountain Front. In 2004, the BLM followed suit, announcing that it was suspending action on its own controversial oil and gas leases on the Rocky Mountain Front (the Startech wells) pending an environmental study that would approach the issue comprehensively. The BLM cited evidence, based on 49,000 public comments received on its EIS, that 93 percent of Montanans and 99 percent of concerned citizens nationwide were opposed to drilling.⁸⁴ These federal actions constituted a sea change in how lands in the Crown of the Continent Ecosystem were being managed. Of the two national forests bordering Glacier National Park, the Lewis and Clark National Forest was historically the one with the stronger orientation to commodity resource extraction. Now it became the national forest with the stronger orientation to the protection of wildlife habitat and recreational and scenic values.



5.6 The North Fork Area

Other longstanding external threats reemerged in the North Fork area. In the early 2000s, Flathead County revived past discussion about paving the lower section of the North Fork Road. Apparently the idea was brought forward by the Columbia Falls business community, who envisioned that the road improvement would encourage a scenic loop drive via the Camas Road, bringing more tourist revenue to local businesses. While the park administration kept a silent vigil on this issue, so did the Flathead National Forest. (Twenty years earlier, the two agencies had each spoken up and taken

⁸⁴ Sax and Keiter, "The Realities of Regional Resource Management," 275-79, 282-84.

opposite sides on the issue.) The Flathead County Commission decided that it did not want to spend money on the project and the proposal was tabled – for the time being.⁸⁵

Across the Canadian border, the threat of mining development loomed large again, as no fewer than four major mining proposals were put before the British Columbia government. The most serious threat was posed by a proposal by Cline Mining Company to construct an open pit coal mine on Foisey Creek. The company initially proposed to mine 250,000 tons of coal per year – a small enough quantity that might have enabled the company to move ahead without preparing a full environmental review under British Columbia’s relatively lax environmental laws. But when Cline disclosed that it planned to expand production to upwards of two million tons per year, there was a public outcry (led by the Flathead Coalition) and in 2005 the provincial government imposed a moratorium on coal development in the lower third of the Canadian portion of the Flathead Basin. Previously, Cline Mining Company filed an application to reopen the earlier Cabin Creek coal mine proposal. The provincial government demurred but gave Cline a preference right should it reverse its decision. The same year that British Columbia put a moratorium on coal development, it offered coalbed methane leases on the upper Flathead but received no bids – presumably because of the public furor over coal development. Meanwhile, Max Resources was exploring for gold in the Howell Creek drainage near the Cabin Creek mine site, with the expectation that it would initiate a cyanide heap leach mining operation if it located gold deposits. At the same time, Canadian and Australian mining firms formed a joint venture in pursuit of another proposed open pit coal mine at Lillyburt, a site twenty miles north of the border in the North Fork flood plain.⁸⁶

In June 2009, a coalition of eleven environmental organizations, some based in the United States and others in Canada, petitioned the World Heritage Center to declare the Waterton-Glacier World Heritage Site a “Site in Danger” until the government of British Columbia would reverse its position on mining development in the region. Four months later, at the invitation of both the United States and Canadian governments, the International Union for the Conservation of Nature (IUCN) and World Heritage Committee sent a group of experts to investigate the mine sites and the threats to the environment posed by mining development. The IUCN/World Heritage mission advised that the proposed mines would cause irreparable damage to the World Heritage Site if mining were permitted. Against a backdrop of mounting regional and international

⁸⁵ Sax and Keiter, “The Realities of Regional Resource Management,” 250-51.

⁸⁶ *Ibid.*, 288-89.

concern, Montana Governor Brian Schweitzer and British Columbia Premier Gordon Campbell signed a memorandum of understanding on February 21, 2010 that banned all mining and oil and gas development in Montana’s North Fork Valley and the Canadian portion of the Flathead Basin. In April 2010, Montana’s Senators Max Baucus and Jon Tester announced a deal in which Conoco/Phillips relinquished 108 oil and gas leases on the Flathead National Forest, located within the U.S. portion of the North Fork drainage, without compensation. While the energy company no longer expected to find significant deposits of oil and gas in the area, this action nonetheless increased pressure on the British Columbia government to take similar protective measures. There were lingering concerns – the mining companies wanted compensation for their \$17 million investment, and the possibility remained that the British Columbia government would reverse course – but indications were strong that the Crown of the Continent Ecosystem had achieved a landmark victory for environmental protection.⁸⁷



5.7 Tribal Relations

Glacier’s relations with the Blackfoot Nation and the Confederated Salish and Kootenai Tribes grew more involved and formalized in the 1990s and 2000s. The park’s *Tribal Relations Report on Government-to-Government Accomplishments* for fiscal year 2008 cited numerous meetings, consultations, and joint undertakings relating to wildlife, fisheries, native plants, fire, cultural resources, and environmental education. Glacier’s

⁸⁷ Kurt Repanshek, “Updated: Coal Mine Proposed North of Glacier National Park Strains US-Canadian Relations,” June 4, 2009, at <http://www.nationalparkstraveler.com/2009/06> <November 11, 2010>; “Delegation from World Heritage Committee Visits Waterton-Glacier International Peace Park,” September 21, 2009, at <http://www.nps.gov/glac/parknews> <November 11, 2010>; “Senators Baucus and Tester Announce Major Lease Retirement in the Flathead Watershed,” Jim Mann, “A mine fight that lasted 36 years,” *Daily Inter Lake*, February 21, 2010; *The Missoulian*, April 28, 2010; Jack Potter comments on draft report.

resource managers cooperated with their counterparts in tribal government on a broad range of issues. In addition, the park worked with the tribes in the areas of interpretation, law enforcement, concessions operations, park employment opportunities, and transit operations on the Going-to-the-Sun Road.⁸⁸

Indian tribes experienced a resurgence of power at the end of the twentieth century. Indian peoples struggled to recover their tribal autonomy through a renewal of ethnic identity and assertion of tribal self-governance. Beginning with the Indian Self-Determination and Education Assistance Act of 1975, numerous federal laws, executive orders, and court rulings strengthened tribal sovereignty and the role of tribal governments within the federal political system. As tribal governments became vested with more power, Indian tribes sought to regain control of their natural resources. The Confederated Salish and Kootenai Tribes (CSKT) were a case in point. In 1977, the tribal government became the first in the United States to hire a fulltime biologist. In 1979, the CSKT designated 89,500 acres on the Flathead Reservation as the Mission Mountain Tribal Wilderness, the first such designation of its kind. In 1982, it declared the Flathead Reservation to be a Class I area under the Clean Air Act, the same air quality standard that Congress had designated for Glacier.⁸⁹ By 1999, the CSKT had a robust fish and wildlife management program whose active projects included bald eagle recovery, peregrine falcon and trumpeter swan reintroduction, habitat management and monitoring for Canadian lynx, wolverines, and fishers, and habitat enhancement and monitoring for bull trout and west slope cutthroat trout.⁹⁰

As tribal governments gained power and influence, the Park Service fashioned new policy for managing tribal relations. The Park Service reached a milestone in this process when it promulgated its Native American Relationships Management Policy in 1987. The policy gave superintendents and resource managers guidance on such issues as practice of Native American religion under the American Indian Religious Freedom Act of 1978, traditional use of plants and other natural resources, and treatment of Native American burial areas.⁹¹ However, the policy was superseded by subsequent legislation, notably the Native American Graves Protection and Repatriation Act of 1990 and the

⁸⁸ Glacier National Park, *Tribal Relations Report on Government-to-Government Accomplishments, Fiscal Year 2008* (West Glacier: National Park Service, 2009), 1-7.

⁸⁹ James Bruggers, "The Salish-Kootenai Comeback," *Sierra* 72 (July/August 1987), 23.

⁹⁰ Brian Lipscomb and Dale M. Becker, "Tribal Fish and Wildlife Management in the Pacific Northwest," *Transactions of the Sixty-fourth North American Wildlife and Natural Resource Conference* (Washington: Wildlife Management Institute, 1999), 462.

⁹¹ Acting Director to Directorate, Field Directorate, All Park Superintendents, enclosing "Native American Relationships Management Policy," *Federal Register* 52, no. 183 (September 22, 1987), in Folder Native American Relations, Cultural Resource Specialist Office Files, GNP.

American Indian Religious Freedom Act Amendment of 1994. Also influential was the release in 1991 of *National Register Bulletin 38*, “Guidelines for Evaluating and Documenting Traditional Cultural Properties.” President Clinton’s Executive Order 13175, announced in April 1994, aimed to strengthen tribal sovereignty through more formalized government-to-government relations, while his Executive Order 13007, issued in May 1996, sought to protect tribal interests in Indian sacred sites. Responding to these developments, the Park Service established an American Indian Liaison Office in Washington and designated tribal liaisons in the regional offices and the field.

Park Service leaders repeatedly pointed out that the Park Service’s interest in tribal relations went beyond the federal government’s overall trust responsibility and special legal relationship to Indian nations. As a member of the directorate noted in 1987, the Park Service had a special responsibility to Indian peoples because:

We manage lands that contain cultural and natural resources essential to their lifeways and cultural survival; we preserve collections of archeological and ethnographic items important to their lifeways and their heritage; and we interpret to millions of Americans annually both the past and the present lifeways of Native Americans and thereby incur a very special requirement to be factually informed, culturally unbiased, and sensitive in our presentations.⁹²

The Park Service’s senior anthropologist, Dr. Muriel Crespi, agreed with that view. She took the position that the Park Service’s responsibility toward Indian peoples should not be limited to Indian sacred sites but should grow out of the agency’s role as the keeper of the nation’s heritage.⁹³ Crespi pushed for a new wave of park ethnographic studies with a focus on “park neighbors and groups whose cultural survival is linked with park resources.”⁹⁴

In the early 1990s, the Park Service contracted with Dr. Brian Reeves, professor of anthropology at the University of Calgary, to produce an ethnographic overview and assessment for Glacier National Park. This study was finally completed and published as “*Our Mountains are our Pillows: An Ethnographic Overview of Glacier National Park*,” by Brian Reeves and Sandra Peacock, in 2001. According to Sax and Keiter, the

⁹² Ibid.

⁹³ Muriel Crespi, “The Potential Role of National Parks in Maintaining Cultural Diversity,” in *National Parks, Conservation, and Development: The Role of Protected Areas in Sustaining Society*, edited by J. A. McNeely and K. R. Miller (Washington: Smithsonian Institution, 1984), 303-04.

⁹⁴ Muriel Crespi, “Saving Sacred Places,” *National Parks* 66 (July/August 1991), 18.

publication of the report came at a critical moment during the negotiations over a traditional cultural property designation in the Badger-Two Medicine area, bolstering the Blackfeet case for a larger area.⁹⁵ In 2008, Glacier obtained a Centennial Challenge Grant and contracted with anthropologist Sally Thompson of the Regional Learning Project at the University of Montana for a follow-up ethnographic study. The park's cultural resource managers hoped that through Thompson's study the ethnographic information would be published in a format for a wider public audience.⁹⁶

Long before the 1990s, park officials had appreciated Glacier's special responsibility toward its Indian neighbors. As early as 1932, Glacier's chief naturalist, George C. Ruhle, went on an excursion to nearby Indian reservations to gather ethnographic information on the tribes "connected with Glacier National Park."⁹⁷ When Glacier began to develop a museum program, Ruhle and other park staff envisioned a number of small museums at separate locations in the park, each with a particular focus. One would be located at Two Medicine and would focus on regional Indian history and culture. The completion of the Going-to-the-Sun Road stifled that plan because it was soon evident that Two Medicine would receive only a fraction of the visitor use that St. Mary received. But rather than locate an Indian ethnology museum at St. Mary, the park deferred to plans by the Bureau of Indian Affairs to establish a Museum of the Plains Indian at Browning, Montana in the center of Blackfeet Reservation.⁹⁸

In 1933, Ruhle coordinated with representatives of the CSKT and the Blackfeet Nation on the tribes' participation in the dedication ceremony for the Going-to-the-Sun Road. The event got off to an unfortunate start when one stake-bed truck bringing tribal members from the Flathead Reservation overturned, killing two passengers. But in spite of that tragedy, the event was a high point in Glacier's early relations with neighboring tribes. For two nights in July, three rows of tepees were arrayed in the meadows above Logan Pass as the Salish, Kootenai, and Blackfeet turned the event into a peace council between hereditary enemies. Besides giving speeches, the Indians held a peace dance and a fire dance. For the 5,000 spectators who gathered on Saturday, July 15, 1933, for the dedication ceremony, the Indian pageant was the highlight of the event. The tribes, for their part, decided in council on the second night that "they had had a great and

⁹⁵ Sax and Keiter, "The Realities of Regional Resource Management," 274.

⁹⁶ Glacier National Park, *Tribal Relations Report on Government-to-Government Accomplishments Fiscal Year 2008* (West Glacier: National Park Service, 2009), 5.

⁹⁷ Glacier National Park, "Annual Report of the Park Naturalist, Year Ending September 30, 1932," Folder 7, Box 191, GNP Administrative Records 1910-1984, GNP Archives.

⁹⁸ E. T. Scoyen to G. C. Ruhle, February 14, 1934, and C. P. Russell to Howard Hays, February 20, 1936, Folder 4, Box 163, GNP Administrative Records 1910-1984, GNP Archives.

profitable time,” and that the ceremony should become an annual event to which all their former enemies should be invited: the Nez Percés, Pend d’Oreilles, Crows, Sioux, Assiniboine, Gros Ventres, Snakes, Stonies, Crees, Sarcees, Kainah, Siksikas, Arapahoes, and Cheyennes.⁹⁹

Among the many natural and cultural resource issues that have concerned the tribes in recent years, two will be mentioned here. In May 1988, the Blackfeet Tribal Council proposed a joint cultural center to preserve and interpret Blackfeet culture, history, and prehistory. The proposed facility would have been located on tribal lands near the park, and would have been planned, designed, constructed, and operated jointly by the Blackfeet Nation and Glacier National Park. Park staff were supportive. Chief of interpretation Clyde Lockwood prepared a development/study package proposal in which he asserted, “This cultural center will initiate a new era of mutual understanding and cooperation between the park and the Blackfeet Tribe and will greatly increase the public’s understanding and appreciation of Blackfeet people and their culture.” Lockwood held numerous discussions with tribal representatives over the course of about one year. A briefing statement prepared in July 1989 indicated that the proposed center was to be directed by a board of governors from the Blackfeet Reservation and Glacier National Park. The initiative lost steam when the regional office rejected it, apparently based on the perception that “the idea got really large and very fuzzy.” The Park Service and the Blackfeet were negotiating how the Blackfeet might play a larger role in providing various visitor services (such as operating a bus service) and it seems that NPS officials were leery of the Blackfeet’s growing list of demands. In 1994, the Blackfeet hired a consultant to restart the discussions over the joint cultural center, and Superintendent Mihalic was receptive. But this time it was the Blackfeet Tribal Business Council that seemed to balk at the proposal, for in July 1995 it terminated the Blackfeet Culture Program, citing a lack of funds. Despite the uncertainty presented by the tribe’s internal politics, Glacier staff wanted to pursue the idea further. As Lockwood had since retired, supervisory park ranger Cindy Nielsen carried the discussion through this next phase. The proposal appears to have struck a final roadblock when the CSKT suggested that the cultural center should include information on other tribes besides the Blackfeet and the Blackfeet were not amenable to this idea.¹⁰⁰

⁹⁹ G. C. Ruhle, “Report of Educational Division: Dedicatory Ceremony of Going-to-the-Sun Highway,” undated, Folder 9, Box 191, GNP Administrative Records 1910-1984, GNP Archives.

¹⁰⁰ Clyde Lockwood, “Blackfeet Cultural Center” (Form 10-238), February 3, 1988, and email chain, 1995, Folder Joint Cultural Center; Cultural Resource Specialist Office Files, GNP; Glacier National Park, “Relations with Blackfeet Indians (Briefing Statement), July 1989, and Charles W. Blackwell to Dave Mihalic, July 29, 1994, Folder Native American Relations, Cultural Resource Specialist Office Files, GNP.

Another joint undertaking between the Blackfeet Nation and Glacier National Park aimed at listing Chief Mountain in the National Register as a national landmark or traditional cultural property. Park officials had long appreciated the fact that Chief Mountain was a sacred site of great significance not only to the Blackfeet but to other tribes in the region. Indians of the Glacier region traditionally used numerous prominent geographic features located in the park area as prayer and fasting sites. The vision quests not only invested those sites with religious significance, their success depended on the practitioner having complete solitude – a condition that became problematic as recreational use of these same areas increased. After the American Indian Religious Freedom Act was enacted, Indians and park officials began to seek some kind of accommodation of Native American religious practice in the park, and their attention gradually came to focus on Chief Mountain. As an outlier on the Rocky Mountain Front with a particularly striking profile, this peak was of outstanding though by no means singular significance to Native American religious practitioners.¹⁰¹

Chief Mountain sits on the border between the park and the Blackfeet Reservation; it may be accessed from the reservation side by road and from the park side via foot trail to Slide Lake and Gable Pass. Periodically the Blackfeet tribal government requested the park administration to close its portion of Chief Mountain to all public access. In 1992, the Blackfeet Tribal Council closed seven quarter sections (about 1,120 acres) on the reservation with the aim of preventing use of the access road by hikers and climbers. As tribal chairperson Earl Old Person explained to a reporter of the *Great Falls Tribune*, it was evident from litter found around the base of Chief Mountain that some hikers and climbers did not respect its sacred status. Privately, tribal members complained that hikers and climbers interrupted religious ceremonies and walked off with ribbons and offerings that had been left by religious practitioners.¹⁰²

Glacier supported the tribe's effort to limit access to Chief Mountain from the reservation side, but it did not want to restrict use of the park area other than to inform hikers and climbers of the mountain's religious significance. A briefing statement prepared in 1993 held that the Department of the Interior's position was that "The park

¹⁰¹ Fladmark interview.

¹⁰² Glacier National Park, "Relations with the Blackfeet Indians: Religious Freedom" (briefing statement), June 10, 1993, Native American Coordinator comments on the June 10, 1993 briefing statement, no date, and anonymous, "Visitor Use and Blackfeet Spiritual Use of Chief Mountain in Glacier National Park," no date, Folder Native American Relations 2, Cultural Resource Specialist Office Files, GNP.

has been set aside for all people, not just Native Americans, and the closure of Chief Mountain to all but Native American religious uses would not be legal or proper.”¹⁰³

Bruce Fladmark, the park’s cultural resource specialist and liaison with the Blackfeet Nation, offered to work with the Blackfeet on nominating Chief Mountain as a national landmark or traditional cultural property. Research for the site designation might have dovetailed with the ethnographic study recently initiated by Brian Reeves. According to Fladmark’s recollection, the main reason that he and the THPO did not pursue the nomination further was that the tribal government was unable or unwilling to provide consistent support for the measure.¹⁰⁴

In the mid-2000s, interest in nominating Chief Mountain as a traditional cultural property revived. The Blackfeet obtained a grant from the Park Service and employed a tribal member to prepare documentation. In 2007, the park’s liaison with the tribe, Lon Johnson, and the tribe’s THPO, John Murray, mutually agreed to cancel the contract for the Chief Mountain Traditional Cultural Property documentation.¹⁰⁵

Glacier has also made significant strides in its relations with the CSKT in recent years. Historically, the park’s relations with the western tribes were far less contentious than its relations with the Blackfeet, mainly because the Flathead Reservation lies fifty miles south of the park whereas the Blackfeet Reservation abuts the park. As a result of that proximity, the Blackfeet and Glacier inevitably tangle over economic issues, such as energy development, water use, range management, and tourism facilities and services, while the western tribes’ involvement in Glacier tends toward cultural matters. The CSKT tribal government has had a strong cultural resources program for many years. Whereas the Blackfeet tribal government has struggled to keep its THPO functioning from year to year, the CSKT Tribal Historic Preservation Department employs a large, permanent staff. The CSKT tribal government and the THPO in particular have been strong supporters of various park initiatives.

¹⁰³ Glacier National Park, “Relations with the Blackfeet Indians: Religious Freedom” (briefing statement), June 10, 1993, Folder Native American Relations 2, Cultural Resource Specialist Office Files, GNP.

¹⁰⁴ Fladmark interview.

¹⁰⁵ Lon Johnson to Christine Whitacre, August 28, 2007, hard copy of email provided by Lon Johnson.



5.8 Cultural Resources

Cultural resources management in the 1990s and 2000s built on foundations laid in the 1970s and 1980s. In the area of historic preservation, for example, the park needed to update its list of National Register-eligible properties when many more buildings reached or approached the fifty-year mark. In 1991, the park contracted with Historical Research Associates, Inc. (HRA) to evaluate those cultural resources. Two years later it contracted with HRA to produce a multiple property nomination of administrative, concession, and private properties in Glacier. The nomination included most park buildings constructed prior to 1945 and supplemental information on interiors and landscape features of buildings previously listed. The nominations were accepted by the Keeper of the National Register in 1996. The individual and district nominations included more than 200 buildings, including the Headquarters, Rising Sun Auto Camp, and Swiftcurrent Auto Camp historic districts. More recent National Register nominations have included those buildings associated with the Mission 66 program, the Lake McDonald Lodge Coffee Shop, and the St. Mary and Logan Pass visitor centers in 2008. The park also consulted with the SHPO regarding eligibility of three post-World War II houses and the Mission 66 administration building within the Headquarters Historic District.¹⁰⁶

Historic preservation continued to pose a challenge for wilderness management. In the early 1990s, a controversy arose over Sperry and Granite Park chalets, Glacier's two remaining backcountry chalets, when it was found that heavy visitor use of the chalets together with their antiquated systems of sewage disposal were causing contamination of the environment and a threat to wildlife. The Wilderness Society, joined by the Sierra Club Legal Defense Fund, called for a fix of the problem even if the

¹⁰⁶ Historical Research Associates, Inc., "Survey, Evaluation, and National Register Documentation of Historic Buildings and Structures at Glacier National Park," 1993; Ann Hubber, "Headquarters Historic District" (National Register of Historic Places Registration Form), 1995; Rodd L. Wheaton, "Glacier National Park Headquarters Historic District and the Mission 66 Housing Program," November 2006, copies provided by Lon Johnson.

only practical fix would be to close the chalets. The question of the chalets' future involved not just the classic tension between preservation and use, but the added dimension of *historic* preservation. The chalets were already listed on the National Register of Historic Places and designated as national historic landmarks. For all practical purposes, permanently closing the chalets would not have served the interests of historic preservation; therefore, the Montana SHPO and other historic preservationists among the general public had a strong interest in seeing that the chalets remained open for public use. The controversy over the chalets pointed up the complexity of weighing social, cultural, economic, and ecological factors in ecosystem management.

The park administration had long suspected that it had a problem with sewage disposal at the chalets. Those suspicions were confirmed when a 1988 surface water study of the leach fields down slope of each chalet revealed that the chalets' overloaded septic systems were failing. The park reluctantly allowed the chalets to continue operating through the next four summer seasons even though the water and sewage systems were not in compliance with state and federal laws. But faced with the threat of a legal challenge by the Sierra Club Legal Defense Fund, Superintendent Lusk and Regional Director Robert M. Baker decided in the fall of 1992 that the chalets would not re-open for business until the sewage treatment problem was solved. Lusk estimated that the closure would last at least three years.¹⁰⁷

The announcement immediately aroused controversy. Governor Stan Stephens protested that the closure was premature and that the Park Service had other options. Many people suspected that NPS officials secretly wanted to make the closure permanent. The concessioner, Belton Chalets Inc., had been running the chalets under a five-year permit that expired at the end of the 1992 operating season. National park concessions policy required that the Park Service make a determination of whether a concession was necessary or appropriate prior to issuing a concession prospectus. It also required that the concessioner should have a reasonable opportunity to make a profit. Although Lusk insisted that the Park Service would seek a solution that would allow for continued operation of the chalets under a new concession permit, some people chose not to believe him.¹⁰⁸

In the fall of 1993 the Park Service prepared an environmental assessment with four alternatives. As anticipated, the cost of environmental protection, historic preservation, and continued public use would be high. Alternative 1 would have

¹⁰⁷ Gil Lusk, "Chalet problems entwined in new regs," *Hungry Horse News*, June 10, 1993; Bob Haraden, "Chalet closures a big Park blunder," *Hungry Horse News*, June 24, 1993.

¹⁰⁸ "Lusk frustrated by public, budget," *Hungry Horse News*, July 15, 1993.

stabilized the buildings but kept them closed to overnight use. Alternatives 2, 3, and 4 offered various approaches to the sewage problem and provided for overnight use, each for a total cost of around \$4 million – about six times the cost of Alternative 1. The park’s preferred alternative involved two water and sewage systems, one for handling gray water from food preparation, employee showers, laundry, and dish washing and another for handling human waste. The latter would be treated in eight composting toilets. One NPS employee would be stationed at each chalet to maintain the water and sewage systems. Renovation of the chalets would include numerous life/safety improvements.¹⁰⁹

The park received an initial funding allowance of \$700,000 in 1994 to complete design work and begin structural repairs. Congress appropriated an additional \$2.3 million for the 1995 fiscal year with the understanding that another \$1.2 million would be raised through private donations. The fundraising drive had begun in 1993 under the auspices of a nonprofit organization, Save the Chalets, formed by Wayne and Kathy Phillips. Although the fundraising organization attracted more than 1,300 donors, it was unable to break through to sizeable donations and finally had to give up. Making do with less than full funding, the park reopened Granite Park Chalet as a backpackers’ shelter without food service or running water. For several years it was operated by Glacier Wilderness Guides. In 1999, the park reopened Sperry Chalet as a full-service backcountry hotel offering cooked meals, bedding, linens, and hot running water, and composting toilets in place of flush toilets, and Belton Chalets, Inc. returned to the park as the concessioner. In 2005, Belton Chalets, Inc. resumed operation of Granite Park Chalet as well.¹¹⁰

The composting toilets ultimately proved to be unworkable. Composting in cool mountain temperatures was too slow to handle the high volume of public use. The park finally gave up on composting and began instead to airlift out the human waste. Meanwhile, although the park set a limit on overnight use, increasing numbers of day hikers put an additional load on the sewage system (especially at Granite Park Chalet when the introduction of a free shuttle service made it possible for day hikers to complete the one-way trip from Logan Pass via the High Line Trail and Granite Park Chalet to the Loop without having to retrieve a vehicle at Logan Pass). Both from the standpoint of

¹⁰⁹ National Park Service, *Environmental Assessment, Management of Backcountry Chalets, Glacier National Park* (Washington: National Park Service, 1993), 25, 123.

¹¹⁰ National Park Service, *Revised Environmental Assessment, Management of Backcountry Chalets, Glacier National Park* (Washington: National Park Service, 1995), 1; “Efforts to save Glacier Chalets comes up short,” *The Missoulian*, May 13, 1999; “Glacier veterans chosen to run park chalets,” *The Missoulian*, December 22, 2004.

managing for wilderness values and minimizing the park's carbon output, the airlift operation was a monstrosity – yet it followed from the park's actions to protect the environment, provide for public use, and preserve the historic chalets.¹¹¹

In the mid 1990s, when the controversy over the chalets was still unfolding, the Park Service held a series of public meetings for the purpose of scoping what issues to address in the park's general management plan. One of the major issues to emerge from the scoping meetings was what to do with the park's historic hotels and visitor services. The public strongly supported preserving them despite the need for making extensive repairs and upgrades to the buildings to keep them functioning as visitor accommodations. At the end of the public planning process, the Park Service was committed to maintaining the Many Glacier Hotel (one of the most famous hotels in the national park system and a national historic landmark), the Lake McDonald Lodge (the oldest hotel in the park and a national historic landmark), the Swiftcurrent Motor Inn (a combination 1930s and Mission 66 development, listed as a historic district in the National Register of Historic Places), the Rising Sun Motor Inn (a housekeeping cabin camp built in 1941, listed as a historic district on the National Register of Historic Places), and Two Medicine Campstore (a national historic landmark). A sixth property, the Village Inn, a motel in Apgar Village that was not deemed to have historical significance, was not included in the historic preservation program at that time. However, it was decided that the park would study options for what to do with the Village Inn when it prepared a commercial services plan for Apgar Village. The latter plan and the final environmental impact statement that accompanied it affirmed that this property, too, would be maintained.¹¹²

With a large amount of rehabilitation of historic buildings looming, Glacier was fortunate to add a historic architect, Lon Johnson, to its staff in 2001. Johnson filled a vacancy on the cultural resources management staff after Bruce Fladmark retired at the end of 2000. Johnson was already familiar with Glacier's historic properties from his past work on the staff of the Montana SHPO.

In 2002, Glacier completed a historic structures report for the Many Glacier Hotel, and some \$10 million of rehabilitation work commenced soon afterward. An

¹¹¹ Jack Potter comments on draft.

¹¹² "Glacier's Tarnished Gems: All Agree Glacier's Hotels Should Be Saved, But the Price is High," *The Fresno Bee* (November 21, 1999); Glacier National Park, *Final General Management Plan Environmental Impact Statement*, Vol. 1 (Denver: National Park Service, 1999), 56-60.

additional \$15 million of rehabilitation work was authorized under the American Recovery and Reinvestment Act of 2009, with work to commence in the fall of 2010.¹¹³

Glacier's general management plan identified visitor use and preservation of the Going-to-the-Sun Road as two more critical issues facing the park administration. Major repairs on the road had been initiated in the 1980s but were progressing slowly due to small amounts of available funding. In 1995 and 1996, when construction crews made repairs on a half mile section of road along the Garden Wall, the difficulty of balancing preservation and use became abundantly clear. Temporary road closures caused a public furor, but various attempts at workarounds – closing one lane of traffic at a time, working at night, working in the shoulder seasons – all had problems as well. The draft general management plan offered three alternatives: no action (which was dismissed as not a viable alternative), a fast-track rehabilitation that would result in closures of the Going-to-the-Sun Road for up to three years on each side of Logan Pass, and another alternative that would complete the rehabilitation over a period of ten or more years. In either of the action alternatives, studies would be made beforehand to ensure that historic values were protected as the rehabilitation proceeded.¹¹⁴

Local business communities objected to both action alternatives and contended that the Park Service had not analyzed economic impacts. In 1998, Congressman Rick Hill (R-MT) held a hearing in Kalispell on what to do about it. Hill's answer was for Congress to make a separate appropriation to do a more specific study and analysis of the road rehabilitation project and appoint an advisory council to oversee the study. Hill introduced a bill that would have appropriated \$200 million for rehabilitation of the Going-to-the-Sun Road and the historic hotels over a six-year period. Hill got his bill through the Republican-controlled House, but it did not find a sponsor in the Democrat-controlled Senate.¹¹⁵

The general management plan was finalized while Hill's legislation was pending; consequently, the planning team had to finesse the possibility that the bill would be enacted into law. Although Hill's legislative initiative foundered, it still influenced the rehabilitation plan that was eventually finalized in 2003. Notably, the plan called for a handful of measures to mitigate the economic impact of a reduction in visitor use of the

¹¹³ "Help for Hotel," *The Missoulian*, September 24, 2002; "\$9.5 M second phase of Many Glacier rehab work goes to Swank Enterprises," *The Missoulian*, March 19, 2010.

¹¹⁴ Glacier National Park, *Final General Management Plan Environmental Impact Statement*, Vol. 1 (Denver: National Park Service, 1999), 50-55.

¹¹⁵ U.S. House, Subcommittee on National Parks and Public Lands of the Committee on Resources, *Future Maintenance and Repair of the Going-to-the-Sun Road in Glacier National Park, Field Hearing before the Subcommittee*, 105th Cong., 2d sess., 1998, Serial 105-115, 3; U.S. House, *Rehabilitation of the Going-to-the-Sun Road in Glacier National Park*, 106th Cong., 2d sess., Rept 106-848, September 14, 2000, 2.

road. These measures included limiting road closures to the shoulder seasons, working on one lane at a time in peak season (with allowance for traffic delays of up to thirty minutes) and implementation of a mass transit shuttle system. The rehabilitation was to be completed in seven to eight years for a total cost of between \$140 and \$170 million.

The rehabilitation plan gave careful attention to the road's historic value to the nation as well as its economic value to local communities. In 2002, Renewable Technologies, Inc., of Butte, Montana, completed a cultural landscape report on the Going-to-the-Sun Road. This study provided a cultural landscape evaluation of the road corridor, a detailed construction history of the road, and treatment recommendations for all of the landscape components: the roadway itself, turnouts, guardwalls, retaining walls, tunnels, bridges, culverts, other minor features, and viewsheds and vistas. This fulsome report followed upon the park's *Going-to-the-Sun Road Cultural Resource Plan* (first edition 1988, second edition 1991), its *Going-to-the-Sun Road Design Guideline* (draft completed in 1995), and an environmental assessment for road repairs prepared in 1999.¹¹⁶

The emphasis on the Going-to-the-Sun Road as a cultural resource reflected the enhanced position of cultural resources in national park management in the 1990s compared to its upstart status twenty years earlier. As the field of historic preservation matured in the three decades following the National Historic Preservation Act, its early emphasis on historic buildings yielded to an emphasis on historic districts, which finally led to the concept of cultural landscapes. One of the leading thinkers on cultural landscapes in the national parks was landscape architect Ethan Carr, whose monograph *Wilderness by Design: Landscape Architecture and the National Park Service* (University of Nebraska Press, 1998) included a chapter-length case study on the "Going-to-the-Sun Road Historic District." Carr's conceptualization of the historic district anticipated the cultural landscape idea, as he showed how the road had been located to take advantage of scenic vistas and other landscape considerations that comprised a large swath of territory through the middle of the park. In another chapter on "Mount Rainier National Park Historic District," Carr went even further and argued that the entire front country of that park should be preserved and interpreted as part of a master design conceived in the 1920s.¹¹⁷

¹¹⁶ Mark Hufstetler, Kathryn L. McKay, and Janet Cornish, *Going-to-the-Sun Road, Glacier National Park, Montana: Cultural Landscape Report*, Vol. 1 (Butte, Montana: Renewable Technologies, Inc., 2002).

¹¹⁷ Ethan Carr, *Wilderness by Design: Landscape Architecture and the National Park Service* (Omaha: University of Nebraska Press, 1998), 139-248.

As historic preservation came to involve broader and broader spatial contexts, practitioners joined Carr in making a deliberate effort to relate their subject more closely to the natural environment. Increasingly, they employed the term “built environment” to describe the complex of buildings, structures, and other cultural modifications that formed an overlay on the natural world. They pointed out that cultural and natural landscape components were not inert, but were in fact blended, each acting on the other. This more expansive and subtle view of historic resources was compatible with the new natural resource management paradigm of ecosystem management, which basically came to the same view of cultural and natural influences from an ecological perspective. Ecosystem management, as noted earlier, sought to integrate cultural, social, economic and ecological considerations in the formulation of land management options. Historic preservation acquired more legitimacy in this context. Some thirty years earlier, when park managers aimed to make Glacier serve as a vignette of primitive America, the idea of preserving twentieth century buildings for their historic value caused park managers some discomfort. Now the historic buildings, historic districts, and cultural landscapes were seen as part of the ecosystem.

Cultural resources management went in other new directions. As Glacier acquired more inholdings around Lake McDonald, a need developed for a historical survey and evaluation of the numerous recreational camps located on those lands. In 2006, Jessie Ravage, a public historian based in Cooperstown, New York, completed a multiple property documentation form for those properties. Her comprehensive report was accompanied by eleven National Register nominations. Most of the buildings featured in this study exhibited a kind of vernacular architecture and history that was distinct from both the Great Northern influence on the park and the landscape architecture influence by way of the Park Service.¹¹⁸

In the field of archeology, John Dormaar made a study of vision quest sites on the east side of the Continental Divide in Waterton Lakes and Glacier. Matthew A. Russell of the Park Service’s Submerged Cultural Resources Unit led a series of dives in four lakes and produced an assessment of the park’s underwater archeological sites. Under a cooperative agreement with the Park Service, the CSKT’s Historic Preservation Department produced a survey of cultural scarred trees in the North Fork valley. Other

¹¹⁸ The eleven nominations covered nine historic districts and two individual buildings. Jessie Ravage, “Recreational Camps on Lake McDonald, Glacier National Park, Montana” (National Register of Historic Places Multiple Property Documentation Form and National Register of Historic Places Registration Forms), February 2006, copy provided by Lon Johnson.

studies included assessments of previously recorded archeological sites around Lake Sherburne and historic homesteads in the North Fork valley.¹¹⁹

The rising importance of cultural resources was also evident in the growth of the museum collection. The park's curator, Deirdre Shaw, who had graduate training in history before she joined the park staff in 1990, made it one of her early priorities to accession the tens of thousands of documents that came into the museum collection from the park library. More recently, responding to a wave of retirements among senior park staff, she initiated a park-wide search of staff offices to evaluate administrative files for permanent retention. The resulting cache of material added considerably to the administrative records collection.¹²⁰

The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) mandated that the park would perform a review of its museum collection and identify all Native American human remains, funerary and sacred objects, and items of profound cultural significance to tribes, consult with tribes, and return those items that tribes wanted to claim under their cultural patrimony. There are no human remains in the museum collection. Under the current Scope of Collections Statement (September 2010), Native American items are divided into two collections: archeology and ethnology. Archeological items have come primarily from archeological investigations conducted in the park. In 2010, there were approximately 8,700 prehistoric items including projectile points, flakes, and ground stone. Most of these items came from 348 identified archeological sites within the park. A few items came into the collection as casual finds made by park staff and visitors. The ethnological collection consists of objects associated with tribes in the Glacier region together with associated records such as field notes, audio and video recordings, artifact inventories, and ethnographic reports.¹²¹ Most of the objects in the ethnology collection were collected in the 1930s by George C. Ruhle or his associates with the expectation that there would eventually be an Indian museum in the

¹¹⁹ John Dormaar, "Vision Questing in Glacier National Park, Montana," *Archaeology in Montana* 43, no. 1 (2002): 1-14; Matthew A. Russell, *Glacier National Park Submerged Cultural Resources Assessment* (Santa Fe, New Mexico: Submerged Cultural Resources Unit, Intermountain Cultural Resources Center, National Park Service, 1997); Dave Schwab, Ira Matt, and Kevin Askan, *Glacier National Park, North Fork Flathead River, Culturally Scarred Tree Survey* (Pablo, Montana: Confederated Salish and Kootenai Tribes, Historic Preservation Department, 2005); Brenda L. Covington and Douglas H. MacDonald, "Final Inventory Report, Glacier National Park, Lake Sherburne Archeological Inventory & Report," (RM-CESU Cooperative Agreement: CA-1200-99-007, University of Montana, Department of Anthropology), February 1, 2008; Douglas H. MacDonald and John Kinsner, "Final Inventory & Evaluation Report, Glacier National Park, North Fork Homestead Archeological Project," (RM-CESU Cooperative Agreement CA-1200-99-007, University of Montana, Department of Anthropology), April 14, 2009.

¹²⁰ Deirdre K. Shaw, interview by Theodore Catton, October 23, 2009.

¹²¹ Deirdre K. Shaw, "Scope of Collection Statement, Glacier National Park," typescript, pp. 15-16, copy provided by GNP Archives.

park. When the Museum of the Plains Indian was opened in Browning, the park loaned most of the items in its ethnology collection to the new museum and they remained there in 2010.¹²²

As part of the review of the collection mandated by NAGPRA, the park contracted with the University of Montana to determine the tribal affiliation of each item in the ethnology collection. The study began in the mid 2000s and was nearing completion in 2010. The park's tribal liaison for cultural issues, Lon Johnson, and the park's curator, Deirdre Shaw, initiated consultation with the affected tribes. In August 2009, Johnson and Shaw took the first step toward possible repatriation of material when they took several items to the Flathead Reservation for inspection by Kootenai tribal elders.¹²³



5.9 New Networks

In 1999, Director Robert Stanton announced the Natural Resource Challenge, a five-year initiative to improve the agency's natural resource capabilities. The Natural Resource Challenge had three major pieces with consequences for Glacier National Park. First, it put the flagging Inventory and Monitoring (I&M) Program on a new, stronger footing. Second, it formalized a network of Cooperative Ecosystem Studies Units that better enabled the agency to obtain research from non-federal partners. Third, it funded the establishment of Science and Learning Centers in a number of parks, including Glacier. These initiatives not only strengthened Glacier's natural resource management program, they also moved the park's organizational culture further down the road of partnering through networks. As this crucial change in organizational culture tended to

¹²² Shaw interview.

¹²³ Shaw interview.

break down the park's traditional insularity, it was itself another manifestation of the park's embrace of ecosystem management.

The Natural Resource Challenge made scientific inventory and monitoring the centerpiece of an enlarged Park Service commitment to science-based natural resource management. Although the Park Service had obtained congressional support for the I&M Program in 1989, and Glacier had made an auspicious start with program funds in 1990, the system-wide program sputtered through much of the 1990s. Although Congress supported the Park Service's I&M Program in principle, it did not follow through with the necessary level of funding. One problem facing the program was the confusion and controversy that attended the creation of the National Biological Survey (NBS). While the Park Service lost all research-grade scientists to the NBS, it retained resource managers who were involved in conducting inventory and monitoring. Unfortunately, the distinction between scientific research and inventory and monitoring was not always clear, which inhibited agency support for the latter type of activity. The I&M Program faced another muddle after the reorganization of the Park Service in the mid 1990s. As the agency looked for cost efficiencies by grouping units of the national park system into smaller geographic clusters than those served by the existing NPS regions, the I&M Program was consumed by this complicated endeavor. Partitioning the national park system into clusters – or “networks” as they came to be known – was complicated because the networks had to reconcile political boundaries and ecosystem boundaries. Since resource sharing was a major thrust of the reorganization plan, networks also needed to take into account logistics of travel and communication between units. The various parks jockeyed for position, seeking an alignment that would augment rather than sap their existing staff resources. Some of the 32 networks that eventually emerged from this convoluted process at the end of the 1990s made less ecologic sense than others. Glacier was included in the Rocky Mountain Network (ROMN), which cobbled together three units in Montana with three units in Colorado, essentially picking up units north and south of the Yellowstone colossus, which formed its own network with Grand Teton National Park and Bighorn Canyon National Recreation Area. Thus, the network that included Glacier stretched from the Canada border to Great Sand Dunes National Park and Preserve in southern Colorado, and also included Grant-Kohrs Ranch National Historic Site, Little Bighorn Battlefield National Monument, Rocky Mountain National Park, and Florissant Fossil Beds National Monument. This widely distributed assortment of areas was characterized by intermountain grasslands as much as it was by mountains. As the Rocky Mountain Network website gamely described it, “Although this is an extremely diverse region, all six ROMN parks share ecological similarities. These units

also have a tradition of working together and are within the same NPS region.”¹²⁴

Glacier and Rocky Mountain dominated the network, since they had by far the largest staffs and budgets.

Once the network was established, the next goal was to complete a biological inventory for each unit. The I&M Program set a target of identifying approximately 95 percent of all animal and plant species occurring in an area. Both Glacier and Rocky Mountain had already attained that standard of biological inventory, so the effort focused on the smaller units in the network. Once those basic inventories were complete, the next step was to select “physical, chemical, and biological elements and processes of park ecosystems that represent the overall health or condition of the park.” These were termed “vital signs,” and they were to form the basis for a long-term monitoring program. Ideally, a selected vital sign would be common to most or all units in the network. As a Park Service website explained, “park vital signs monitoring is designed to inform managers of the condition of water, air, geologic resources, plants and animals, and the various ecological, biological, and physical processes that act on those resources.”¹²⁵

In selecting the vital signs and developing the protocols for long-term monitoring, Glacier’s resource management staff worked with scientists outside the agency. A seminal meeting occurred in January 2005 at the University of Montana’s Yellow Bay Biological Station in which participants divided up by subject expertise and then came together to fashion a list of vital signs objectives. Despite some tension between academic scientists and federal resource managers – manifested, for example, in the aquatic biologists’ exaggerated claims about how much they knew about aquatic insects, which contrasted with the weed specialists’ more circumspect presentation of the information they had on exotic plants – the collaboration that occurred at Yellow Bay was characteristic of the Park Service’s new way of obtaining science for management. At Glacier, ecologist Tara Carolin worked with other Park Service employees in the Rocky Mountain Network in arranging for work to be performed by academics. In particular, the Park Service relied on the efforts of academic scientists at Colorado State University and the University of Montana to develop monitoring protocols for the various vital signs. The bulk of these numerous separate assignments, such as Glacier’s rare plant monitoring protocols prepared by Peter Lesica and Elizabeth E. Crone of the University of Montana, were in the process of review by senior I&M Program

¹²⁴ U.S. Department of the Interior, National Park Service, “National Park Service, Inventory & Monitoring Program,” (April 13, 2009), <http://science.nature.nps.gov/im/units/romn> <April 5, 2010>.

¹²⁵ National Park Service, “Park Vital Signs Monitoring: Taking the Pulse of the National Parks,” www.nature.nps.gov/challenge/brochures/vital_signs_monitoring_Mar_2004_screen.pdf, (April 16, 2008).

administrators at the end of the 2000s. By then, the Rocky Mountain Network had come to include regular park staff who focused on I&M, a technical committee that advised on network issues, a board of directors that was responsible for program accountability, a variety of scientific and technical partners, as well as supervisory I&M Program staff located in Fort Collins, Denver, and Washington.¹²⁶

The vital signs monitoring networks dovetailed with the Cooperative Ecosystem Studies Unit (CESU) Network. Both took shape in the mid to late 1990s and received strong support under the Natural Resource Challenge promulgated in 1999. The aim of each CESU was to facilitate the exchange of science, technical services, and education between federal agencies and non-federal partners. The latter featured universities but also included state agencies and non-government organizations. Each CESU was located at a host university and was staffed by a handful of federal employees. Each CESU served a network of federal agencies on the one hand and a network of academic institutions (as well as other partners) on the other hand. The Rocky Mountain CESU was based at the University of Montana and primarily served an area encompassing Montana, Idaho, Wyoming, and Colorado. Unlike the vital signs monitoring networks, the CESU Network was multi-agency, although the Park Service spearheaded it. The Rocky Mountain CESU superseded the strictly Park Service entity known as the Cooperative Park Studies Unit (CPSU), located on the University of Montana campus since 1990. With the strong backing of Secretary of the Interior Bruce Babbitt and the Natural Resource Challenge, the CESU Network flourished, greatly enhancing the Park Service's ability to obtain high-quality science for the benefit of park management. In Glacier, resource managers were largely relieved of the burden of preparing requests for proposals and selecting contractors since they could now partner with outside scientists with relative ease through the mechanism of cooperative agreements administered by the CESU.¹²⁷

¹²⁶ Tara Carolin, interview by Theodore Catton, October 22, 2009; Mike Britten, E. William Schweiger, Brent Flakes, Dan Manier, and David Pillmore, *Rocky Mountain Network Vital Signs Monitoring Plan*, Natural Resource Report NPS/ROMN/NRR-2007/010 (Fort Collins: U.S. Department of the Interior, National Park Service, 2007). For an example of monitoring protocols for a specific vital sign, see Peter Lesica and Elizabeth E. Crone, "Monitoring Vital Signs in Glacier National Park: Rare Plant Monitoring Protocols," March 2007, George C. Ruhle Library, GNP. Lesica and Crone state that the monitoring program must be based on "a trade-off between statistical power to detect trend and the amount of time and money available." In preparing the monitoring protocols, Lesica and Crone selected 66 potential indicator species and experimented with sample plots that varied in size, sampling frequency, and whether they were to be temporary or permanent. The goal was "to develop a plant monitoring program for Glacier National Park that tracks changes in key indicators of the integrity of park ecosystems, so that management policies can be changed if necessary to maintain or restore ecological processes and biodiversity."

¹²⁷ Pamphlet titled "Cooperative Ecosystem Studies Units, An Introduction," [2000], Central Files FY 1999, GNP Archives; Potter interview.

The third critical piece in the Natural Resource Challenge with important consequences for Glacier was the Science and Learning Center initiative. As with the I&M Program and the CESU Network, the intent of learning centers was to change the Park Service's organizational culture so that parks would actively engage in partnering through networks. The Park Service, by way of the Natural Resource Challenge, pledged to support a select number of learning centers in various units of the national park system. Each learning center would aim to facilitate scientific research and educational opportunities in the park (or in many cases, a network of parks) and to disseminate the fruits of park-based science to educators and the general public. Parks had to bid through a competitive proposal process to obtain a science and learning center, and when parks were selected they normally received a sizable increase in base funding. Glacier's proposal was among eight selected in a second round of competition held during the Fiscal Year 2002 budget cycle.¹²⁸

Glacier established the Crown of the Continent Research Learning Center in 2002. The park recruited two Ph.D. scientists, Leigh Welling and Sallie Hejl, to serve as the center's director and resource education specialist, respectively. Dr. Welling, in accordance with park management's original vision for the center, focused on developing links with area schools and educators teaching at the K-through-12 level. She also involved the center in the Crown of the Continent Managers Partnership and organized the annual Waterton-Glacier Science and History Day to bring researchers together with interested members of the public and raise the profile of science in the two parks.¹²⁹

With the I&M Program, the Rocky Mountain CESU, and the Crown of the Continent Research Learning Center all in place, the Natural Resource Challenge had clearly succeeded in strengthening the science program in Glacier National Park. In 2004, Superintendent Mick Holm decided upon a staff reorganization to elevate resource management within the park's organizational structure. He moved the natural resources staff out of the Ranger Division and transferred the cultural resources staff (the historic architect and the museum curator) from the Division of Interpretation to the new Division of Science and Resources Management. For a short time the park's chief scientist, Leo Marnell, headed the new division. When Marnell retired, assistant chief Jack Potter was appointed division chief. Potter, a Glacier employee since the early 1970s and one of the

¹²⁸ Deputy Director to Regional Directors, September 6, 2000, Central Files FY 2000, GNP Archives.

¹²⁹ Mick Holm, interview by Theodore Catton, October 21, 2009; Potter interview; "Leigh Leaves to Head NPS Climate Change Program," *Science in the Crown* 4, no. 1 (April 2008): 2.

old breed of natural resource rangers, gave the division strong leadership through the rest of the decade.¹³⁰

Not long after the staff reorganization, Holm decided that the learning center should evolve in a new direction, putting more emphasis on attracting researchers who were involved in higher education. Holm's thinking about the center stemmed from his experience talking to various groups of stakeholders in the Glacier area, who demonstrated growing concerns about global warming and the conservation of biodiversity. "We needed more public support, more involvement," Holm recounted. He wanted the learning center to provide a better platform for disseminating the educational benefit of research in the park so that stakeholders would gain a stronger sense of what was being accomplished and what else was needed to protect park resources. Holm repositioned the center by placing it under the Division of Science and Resources Management.¹³¹

In 2008, Dr. Welling left Glacier to head up the Park Service's Climate Change Program. Although her six years of leadership of the center were praiseworthy, her departure was not unexpected because total annual funding for the center was flat (at \$225,000 per year) while personnel costs for running the center had grown year by year and were straining the center's budget. Park management now realized that it had overreached when it hired two Ph.D.s to run the center in the first place. After Welling's departure, Dr. Hejl served as director for about a year before taking a job with the Fish and Wildlife Service early in 2009. The park filled in behind Welling and Hejl by appointing Tara Carolin, an ecologist with the park since 1996, as the new director and hiring Paul Ollig as resource education specialist. As Carolin had worked with many of the park's researchers through her previous work as research permit coordinator, she was already well-versed in the park's science partnerships.¹³²

Under Carolin's direction, the learning center emphasized communicating park science to the general public and involving the public in the park's research program. A major component of this outreach was the park's Citizen Science Program. As it developed after 2005, the program utilized trained park visitors, staff, and volunteers to collect scientific data that is helpful to park management. In 2011 there were projects underway involving surveys of common loons, observations on three species of concern in the high country (mountain goats, pikas, and Clark's nutcrackers, and documentation on the occurrence of invasive weeds.

¹³⁰ Holm interview; Potter interview; Tara Carolin comments on draft report.

¹³¹ Ibid.

¹³² Ibid.



5.10 Glaciers and Climate Research

Concern that the glaciers in Glacier National Park are vanishing is not new; in fact, it is as old as the park itself. When Glacier was established in 1910, the global pattern of glacier retreat since about 1850 was well known. Soon after the park's establishment, the U.S. Geological Survey assigned Dr. William C. Alden to study the area's glacial history. Alden thought that the park then contained about 90 glaciers, ranging in size from the Blackfoot Glacier, which he estimated to cover three square miles, down to small glaciers of just a few acres in extent.¹³³ In 1922, the first park naturalist, Morton J. Elrod, together with Harvard professor E. V. Huntington and president of the Park Saddle Company W. N. Noffsinger, drove a line of stakes into the Grinnell Glacier to record the movement of the ice, but its surface was melting so rapidly that the stakes soon fell down.¹³⁴ Elrod knew from personal observation that Grinnell Glacier was rapidly shrinking. In the early 1930s, Elrod wrote that Alden's description of the glacier was no longer accurate. "During the twenty years since the writing of Mr. Alden's story the ice has greatly receded from every direction along the foot and sides. At the 'crest of the cliff which rises abruptly nearly 1000 feet from the valley floor above Grinnell Lake' there is now an open basin, covered with glacial deposit," he wrote. "Above this is a second cliff of a hundred feet or so, then several ledges before ice is reached. The ice does not touch the moraine at either side."¹³⁵

In 1931, Glacier National Park, together with a handful of other western national parks, initiated a program of glacier monitoring with the support of the Committee on Glaciers of the American Geophysical Union. Park staff selected four glaciers and

¹³³ M. E. Beatty and Arthur Johnson, "A New Lease on Life for Glaciers in Glacier National Park?" January 20, 1952, Folder 11, Box 274, GNP Administrative Records 1910-1984, GNP Archives. More recent studies have posited that the park area contained perhaps 150 glaciers in 1850, more than two-thirds of which had disappeared by 1980. See Myrna H. P. Hall and Daniel B. Fagre, "Modeled Climate-Induced Glacier Change in Glacier National Park, 1850-2100," *BioScience* 53, no. 2 (February 2003), 131.

¹³⁴ W. N. Noffsinger to M. J. Elrod, October 16, 1922, Folder 6, Box 14, Series IV, Morton J. Elrod Collection (MSS 486), K. Ross Toole Archives, Mansfield Library, University of Montana.

¹³⁵ "Grinnell Glacier," no date, Folder 10, Box 16, Series IV, Morton J. Elrod Collection (MSS 486), K. Ross Toole Archives, Mansfield Library, University of Montana.

undertook yearly measurements from two fixed points just below each glacier terminus to monitor the extent of glacial recession. From 1937 to 1939, and again in 1946, seasonal ranger naturalist Dr. James L. Dyson produced a series of maps of the Grinnell, Sperry, and Jackson glaciers using plane table, telescopic alidade, and stadia rod. Using the maps, Dyson calculated the amount of loss both in surface area and ice volume from year to year. Using historic photos, he also estimated the amount of loss since the early 1900s. He estimated that the glaciers had lost more than half their area and volume from 1900 to 1946.¹³⁶

In 1945, park naturalist M. E. Beatty and the U. S. Geological Survey's Arthur Johnson devised a more rigorous method of glacier monitoring, mapping the entire front of the Grinnell, Sperry, and Jackson glaciers each year using plane table and stadia rod. In addition, they initiated cross profile and longitudinal profile measurements of the Grinnell and Sperry glaciers to measure changes in surface elevation. In 1949, the park arranged with the U.S. Weather Bureau and the U.S. Geological Survey for the installation of a stream flow gauge at the outlet of Grinnell Lake to record run-off from the glacier basin and a precipitation storage gauge at the upper end of the Grinnell Glacier trail. A weather station was added two years later at the latter site to measure maximum and minimum daily temperatures during the summer period. Ranger naturalists collected the data during their regular guided hikes.¹³⁷

In 1950, the park experimented with an alternative method of glacier mapping using aerial photographs. One flight on September 1, 1950, produced 103 photos of approximately 30 glaciers within the park. A topographic map of one glacier – Jackson Glacier – was produced before funds ran out. While aerial photography had definite advantages over the earlier field survey method, it was expensive. The park made another aerial survey in 1952, with financial support from the American Geographical Society and the Glacier Natural History Association, and then the program lapsed owing to the difficulty of obtaining funds. In 1960, the Park Service found money for one more aerial survey, and a map of Grinnell Glacier was produced based on comparison of the 1950 and 1960 photographs.¹³⁸

¹³⁶ M. E. Beatty and Arthur Johnson, "A New Lease on Life for Glaciers in Glacier National Park?" January 20, 1952, Folder 11, Box 274, GNP Administrative Records 1910-1984, GNP Archives.

¹³⁷ "History of Glacier Measurement Program in Glacier National Park," File 732-06.1, Box 69, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

¹³⁸ Chief Park Naturalist to Superintendent, August 27, 1953, Folder 11, Box 274, GNP Administrative Records 1910-1984, GNP Archives; Acting Chief, Division of Interpretation to Regional Director, March 4, 1960, and Regional Chief of Interpretation to Superintendent, April 8, 1960, Folder N3031, Box 24, Numerical Subject Files 1949-65, RG 79, NA-RMR; Director, Geological Survey to Director, National Park Service, March 26, 1965, Folder N3031, Box 36, Numerical Subject Files 1949-65, RG 79, NA-RMR.

As earnest as these early glacier monitoring efforts were, they had a different thrust from climate change studies in the past two decades. As park naturalist Harry B. Robinson remarked in 1957, “The principal interest of the National Park Service in glacier research is interpretive.” The park collected data so that it could give information to park visitors. The park was most interested in Grinnell Glacier since it was the most accessible glacier, being viewed at close range by some 50 hikers per day during the summer season. The U.S. Weather Bureau, meanwhile, was interested in the glaciers primarily as climate indicators.¹³⁹ But even in the latter context, no one involved with glacier monitoring in the 1950s was asking how the disappearance of glaciers might influence the hydrologic regime in Glacier, or how those changes would impact plant and animal life.¹⁴⁰ Indeed, there was some speculation that the climate in the 1950s was entering a cooler, wetter period and that the park’s glaciers were “due for rejuvenation.”¹⁴¹ One scientist with the U.S. Geological Survey believed that as recently as the fifteenth century the park area had been altogether devoid of glaciers.¹⁴² If glaciers came and went so often, then one might presume that the ecosystem was relatively resilient to those frequent oscillations in the volume of water stored as ice in the mountains. But the contemporary view on the warming trend – and on the age of the dwindling glaciers – affords no such cause for complacency. In a recent paper, the U.S. Geological Survey’s Daniel B. Fagre warned that the glaciers would likely disappear by 2030, with serious implications for the ecosystem. “These alpine glaciers have been continuously present for approximately 7,000 years,” Fagre wrote, contradicting the view taken by the USGS geologist 50 years earlier, “so their loss from GNP in another 25 years underscores the significance of current climate change.” Fagre predicted there will be more forest fires, among other consequences, when the glaciers are gone.¹⁴³

¹³⁹ Discussion of Glacier Research in Glacier National Park, Memorandum of meeting at Helena, March 12, 1957, Folder N3031, Box 24, Numerical Subject Files 1949-65, RG 79, NA-RMR.

¹⁴⁰ For example, see R. A. Dightman, “Grinnell Glacier Studies, A Progress Report as Related to Climate,” *Monthly Weather Bureau* 84, no. 9 (September 1956): 329-32.

¹⁴¹ “History of Glacier Measurement Program in Glacier National Park,” File 732-06.1, Box 69, Region II Central Classified Files 1936-52, RG 79, NA-CPR.

¹⁴² “Park Glaciers Experienced Nine Advances, Expert Says,” *Great Falls Tribune*, July 23, 1956.

¹⁴³ Daniel B. Fagre, “Adapting to the reality of climate change at Glacier National Park, Montana, USA,” *Proceedings of the First International Conference on the Impact of Climate Change: On High-Mountain Systems, Bogota, Colombia, November 21-23, 2005* (Bogota, Colombia: Instituto de Hidrologia, Meteorologia y Ambientales IDEAM, 2007), 221. However, a Park Service report in 2004 suggested that the glaciers present in Glacier National Park today are not that old. “The present day ice is probably not the remnants of Pinedale Glaciation. About 6,000 years ago all glacial ice probably disappeared from the mountains. After this there was a warm, dry climatic period during which it is probable that no glaciers were present (Carrara 1986). Then about 4,000 years ago the climate became wetter and cooler again, and small glaciers today were formed (Dyson 1966).” (Trista Thornberry, *Glacier National Park: Geologic*

It was precisely for the purpose of investigating potential effects of climate change on natural systems that Congress authorized the U.S. Global Change Research Program (USGCRP) in 1990. Scientists working in Glacier National Park immediately saw the value of making the park a center of USGCRP research. “Glacier National Park is ideally suited for climate change research in the Northern Rocky Mountain biogeographic region,” wrote park scientists Carl H. Key and Leo F. Marnell. “Important features include a pristine resource effectively isolated from most human disturbances and a high degree of biophysical diversity. Three major continental drainages and five floristic provinces converge in an area influenced by Pacific Maritime and continental weather systems. Pronounced elevation gradients create a mosaic of habitat types and distinct ecotones. An established resident science program is in place with advanced on-site natural resource technologies, including GIS and remote sensing capabilities.”¹⁴⁴ So began one of a handful of proposals prepared for the USGCRP in the early 1990s by park scientists, faculty members at the University of Montana, and researchers with the Forest Service’s Fire Sciences Lab in Missoula.

Climate change research was perfectly aligned with the shift to ecosystem management. One of its major themes was to understand past, present, and future effects of climate on hydrologic processes and aquatic ecosystems. Those hydrologic processes and aquatic ecosystems extended well outside the park boundary. On the west side of the divide, for example, climate change researchers talked about the Flathead River catchment, a large watershed within the “Glacier National Park Biogeographic Area,” or bioregion.¹⁴⁵ Dan Fagre liked to refer to Glacier’s high, snowy mountains as the bioregion’s “water towers.”¹⁴⁶ By employing the image of a manmade structure, he underscored the fact that glaciers and snow pack served to hold water in the mountains during the cold months of the year and then release that stored water to downstream users during the summer season – much like a municipal reservoir or water tower. In a similar vein, Fagre and others began employing the term “ecosystem services” to describe benefits that humans collectively received from natural resources. According to Wikipedia, scientists have been talking about “ecosystem services” for decades but the term only became popularized and formalized in recent years as a result of the United

Resource Evaluation Report [Denver: U.S. Department of the Interior, National Park Service, Geologic Resources Division, 2004].

¹⁴⁴ Carl H. Key and Leo F. Marnell, “Global Change Operations and Conceptual Research Plan for Glacier National Park Biogeographic Area,” October 1, 1990, George C. Ruhle Library, GNP.

¹⁴⁵ Leo F. Marnell, Steven W. Running, Jack A. Stanford, Craig N. Spencer, and F. Richard Haeur, “Global Change Research Proposal for the Glacier National Park Biogeographic Area, Effects of Climate Change on Hydrologic Systems and Associated Aquatic Biotas,” March 7, 1991, George C. Ruhle Library, GNP.

¹⁴⁶ Fagre interview.

Nations Millennium Ecosystem Assessment (2004). If the utilitarian ring of terms like “water towers” and “ecosystem services” seemed a bit startling in the national park context – more reminiscent of Gifford Pinchot and George Perkins Marsh than Stephen Mather and John Muir – the new vocabulary was another reflection of how once-sharp distinctions between national parks, national forests, and other public lands had become blurred as all managers of public lands embraced concepts of ecosystem management at the end of the twentieth century.

Climate change research in Glacier National Park was something of an experiment. Climate change models could predict *global* change with increasing precision and confidence, but efforts to scale those models to the regional level were still in their infancy in 1990. Climate change scientists recognized that global trends – a rise in temperatures, longer growing seasons, more drought, diminishment of glaciers and snow pack – would vary significantly from region to region. Topography would influence how landscapes responded to climate change. Changes on a landscape scale – for example, a change in the amount of forest cover or a change in the amount of sunlight-reflecting snow on the ground in late spring – would, in turn, influence climate. As ecosystems responded to climate change, some changes in the landscape would tend to compound other effects on the landscape, while some changes would act to offset or buffer against other effects. Climate change scientists developed scenarios for describing those stacked and jumbled consequences. Steven Running and Ramakrishna Nemani predicted that a doubling of carbon dioxide in the atmosphere over northwestern Montana would lead to warmer temperatures, shorter duration of mountain snow pack, a longer growing season, more photosynthetic production of vascular plants, and greater water uptake in forest habitats. Even though precipitation might *increase* by about 10 percent, the trend would be toward drier forests and an estimated 30 percent *decrease* in freshwater stream flow. One of the major aims of the Global Change Research Program was to refine scenarios such as this one so that the scenarios had a level of precision and confidence that would make them useful for land managers. It called on the Park Service to investigate the potential effects of climate change on natural systems in several national parks. The Park Service responded with a similar set of objectives: its aims were to (1) contribute to the understanding of ecosystem response to climate change, (2) contribute to a national monitoring network of measurable signs of climate change, and

(3) assess the future impacts of climate change on natural and cultural resources under the protection of the national park system.¹⁴⁷

Dan Fagre headed the Global Change Research Program in Glacier. With a Ph.D. in animal behavior, he had a combination academic and Park Service background and was working at Indiana Dunes National Lakeshore when Cliff Martinka invited him to take the new position on climate change research. From 1991 to 1993, Fagre was on the Glacier park staff; then he transferred to the NBS, and in 1996 he transferred with the rest of the NBS into the U.S. Geological Survey (USGS). For some years, Fagre and the other former park scientists were attached to an office in Fort Collins, Colorado. Later they were placed with the Northern Rocky Mountains Science Center, which was based in Bozeman and included other former Park Service scientists who had been stationed in Yellowstone. But Fagre and the rest of the cadre in Glacier remained duty stationed in the park headquarters area at what was informally called the Glacier Field Station. Fagre liked to joke that his humble office on Mather Drive was world headquarters since it was so globally networked, with connections to some 20 different universities and nearly as many foreign countries.¹⁴⁸

Studying the effects of climate change on the park's glaciers was only a part of Fagre's research, but it was central to the wider project of modeling climate-induced changes to the ecosystem. One reason that understanding the process of glacial retreat had importance beyond Glacier National Park was that glaciers were an excellent barometer of global climate change. The relationship between changes in temperature, precipitation, and cloud cover on one hand, and changes in glacier mass on the other, were relatively straightforward. This was especially true for the small glaciers found in the Crown of the Continent Ecosystem, which contrasted, for example, with the huge glaciers found in Alaska that had their source in giant ice fields. Since those ice fields had accumulated over tens of thousands of years of earth climate history, the retreat of Alaska glaciers – though dramatic overall – was much more difficult to read as a signal of recent climate change. In this regard, glacier retreat in Glacier National Park could be viewed as an early warning system for earth changes happening on a broader scale.¹⁴⁹

¹⁴⁷ Marnell et al., "Global Change Research Proposal for the Glacier National Park Biogeographic Area, Effects of Climate Change on Hydrologic Systems and Associated Aquatic Biotas," 1-3; Fagre interview; Daniel B. Fagre and David L. Peterson, "Ecosystem Dynamics and Disturbance in Mountain Wildernesses: Assessing Vulnerability of Natural Resources to Change," *USDA Forest Service Proceedings*, RMRS-P-15, Vol. 3 (2000), 74.

¹⁴⁸ Fagre interview.

¹⁴⁹ Hall and Fagre, "Modeled Climate-Induced Glacier Change in Glacier National Park, 1850-2100," 132; Fagre interview.

Glacial retreat was also something of a linchpin for predicted changes in the Crown of the Continent Ecosystem. Glaciers, like snow pack, stored precipitation in the mountains from the cool to the warm period of the year. But unlike snow pack, which vanished in most of Montana's high country by mid summer, glaciers continued to feed mountain streams through the whole summer season. "Because glacial meltwater is an important component of stream base flow in late summer," wrote Fagre and Myrna H. P. Hall, "temperature-sensitive organisms must shift their distribution or perish as summer water temperatures rise in streams no longer fed by glaciers." Many aquatic species such as bull trout, already a species of concern due to competition from exotics and other forms of habitat degradation, would likely face serious consequences from the loss of glaciers.¹⁵⁰

The U.S. Global Change Research Program tied in with the Park Service's own Vital Signs program. The shrinking glaciers were selected as one of the vital signs for the Rocky Mountain Network. Climate change scientists proposed other things to monitor under this program as well. For example, Fagre suggested that climate-change monitoring techniques employed in the Austrian Alps were suitable for Glacier, and with his encouragement a monitoring program involving high-altitude plants was included among the park's vital signs. The emphasis that the I&M Program gave to *long-term* monitoring made it a good fit with climate change modeling.¹⁵¹

Peter Lesica, a botanist affiliated with the University of Montana, began studying the effects of a warming climate on high-altitude plants in Glacier in the late 1980s. Lesica selected six species of vascular plants and two species of mosses that were found in wet tundra above timberline in the Logan Pass area. These species were at the southern limit of their respective ranges; therefore, they were apt to be sensitive indicators of the effects of a warming climate.¹⁵² Lesica's work in Glacier also extended to an inventory of vascular plants, a monitoring protocol for rare vascular plants, another long-term monitoring study involving rare boreal plants in fens, and a new field guide to the park's flora. Lesica's 520-page *Flora of Glacier National Park* was published by Oregon State University Press in 2002.¹⁵³

¹⁵⁰ Hall and Fagre, "Modeled Climate-Induced Glacier Change in Glacier National Park, 1850-2100," 132.

¹⁵¹ Fagre interview.

¹⁵² Peter Lesica and Bruce McCune, "Monitoring the Effects of Global Warming Using Peripheral Rare Plants in Wet Alpine Tundra," final report prepared for Glacier National Park, Research Division, January 1992, George C. Ruhle Library, GNP.

¹⁵³ Peter Lesica, "Inventory of the Vascular Plant Flora of Glacier National Park, Montana," prepared for USDI National Park Service, Glacier National Park, January 1994, George C. Ruhle Library, GNP; Peter Lesica, "Monitoring Rare Boreal Plants in Fens of Glacier National Park, Montana, 2005 Progress Report," prepared for National Park Service, Glacier National Park, January 2006, George C. Ruhle Library, GNP.

In another instance of biological research aimed at understanding the effects of climate change on the Crown of the Continent Ecosystem, Loren L. Bahls of the Montana Department of Environmental Quality recorded the distribution and abundance of two species of diatoms in water samples taken at several locations in the park. Bahls predicted that one species, which is rare and considered a glacial relict species, would decline in response to the warming climate. The other, which Bahls described as an “aggressive invader that forms conspicuous growths on stream bottoms,” was predicted to spread as a consequence of climate change. Growths of the latter species, *Didymosphenia geminata*, called “didymo” or “rock snot,” were known to alter food web structure and stream ecosystem function, degrade water supplies, modify stream hydraulics, and impact fisheries, recreation, and hydropower.¹⁵⁴ The research on diatoms was a reminder that even the lowest life forms would respond to climate change and set in motion further changes in the ecosystem.

The prospect of global climate change raised philosophical questions. It put a new frame around the old debate over just how much manipulation resource managers should undertake in their mission to preserve natural conditions. Bill McKibben’s *The End of Nature* (1989) pointed out that if human civilization was indeed implicated in global warming, then pristine wilderness had become an artifact of history – it had ceased to exist anywhere on the planet. Glacier’s chief scientist, Cliff Martinka, believed that McKibben and other writers had thrown down the gauntlet for all those engaged in managing protected areas. “The prospect of global climate change has prompted some authors to question the future of national parks,” Martinka wrote. “They argue that a world of continuous ecological change will deprive nature of its independence, thereby rendering the preservation ethic irrelevant....It seems appropriate to revisit traditional conservation philosophy and construct a new framework that includes the reality of permanent ecological change.”¹⁵⁵

There was a danger that all of the concern about climate-induced ecological change would unhinge natural resource management in the national parks, detach it from its traditional coupling with the preservation ideal. Both the Leopold Report of 1963 and its antecedent, *Fauna in the National Parks*, authored by George Wright and his assistants in 1932, had proclaimed the significance of national parks as authentic reflections of a bygone, pristine world. The Leopold Report had provided resource

¹⁵⁴ Loren L. Bahls, “Diatom Indicators of Climate Change in Glacier National Park,” *Intermountain Journal of Sciences* 13, no. 4 (December 2007), 99.

¹⁵⁵ C. J. Martinka, “Conserving the Natural Integrity of Mountain Parks: Lessons from Glacier National Park, Montana,” undated, unprocessed administrative records, GNP Archives.

managers with a clear directive, “As a primary goal, we would recommend that the biotic associations within each park be maintained, or where necessary recreated, as nearly as possible in the condition that prevailed when the area was first visited by the white man.” This historicized view of nature in the national parks was carried into a generation of resource management plans in the 1970s and 1980s. Both the Leopold Report and *Fauna in the National Parks* stressed the importance of conducting historical research on past biological conditions as a first step in making sure that restoration ecologists got it right. Yet when resource management professionals gathered for the biannual George Wright Society conference in Portland, Oregon in March 2009, there was much talk that “history” (in the biological sense of uncovering what natural conditions were like in the past) no longer had any usefulness to natural resource managers. In a warming world, restoration ecology might be obsolete.

Not everyone agreed with that new point of view. The Park Service continued to support fire ecologist Stephen Barrett’s longstanding study of Glacier’s fire history, for example. For twenty years Barrett had been studying the park section by section, using a methodology that combined core samples of fire-scarred trees, spatial analysis of dominant tree species, and fragmentary historical references to fire over the past 200 years, and was nearing completion of a fire history for Glacier that was perhaps as comprehensive as any in the national park system. Still, at the end of the first decade of the twenty-first century Barrett’s fire history looked somewhat academic. “Why did we do it? The idea is that if you don’t know what happened in the past then you can’t manage for the future,” said Glacier’s fire ecologist Dennis Divoky, adding, “Now the problem of climate change poses the question whether the whole applecart is upset.”¹⁵⁶

Indeed, Barrett’s fire history underscored the challenges that resource managers would face in the coming century as Glacier’s forests responded to climate change. Resource managers now recognized, for example, that the 500-year-old hemlock forest in the Avalanche Creek area had established itself in a period when the area’s climate was relatively cool and wet. The hemlock trees were a relict population and if that forest were to burn it would be replaced by a different forest type altogether, one that was adapted to warmer, drier conditions.¹⁵⁷

Climate change cast a new light on fire suppression. Ever since the Leopold Report, the park had been slowly backing away from all-out fire suppression, striving to reintroduce natural fire into the ecosystem. As warmer temperatures tend to dry out the

¹⁵⁶ Divoky interview.

¹⁵⁷ Divoky interview; Fagre interview.

vegetation and the soil, climate change raised the prospect of more fire. Climate change models predicted rising temperatures in the spring, which would mean that more of the precipitation would come as rain instead of snow, reducing the amount of snow pack. Already in the first decade of the twenty-first century, snow packs disappeared two to four weeks earlier than in the past. If this pattern was indeed a trend, then the fire season would lengthen, fire frequency would increase, and more fire- and drought-tolerant tree species such as lodgepole, larch, or ponderosa would eventually replace the existing forest. The 2003 fire season was possibly a bellwether. The Roberts Fire, which burned over much of the McDonald Lake area, was the largest of several big fires that year. The 2003 fires burned approximately one-third of the burnable vegetation in the park – an equivalent proportion to what burned in Yellowstone in 1988. Barrett’s fire history showed that the area had experienced fires on this scale before in the 1830s, the 1870s, and the 1920s. The 2003 fire season was not a break with the past – as long as it did not repeat itself too often. But if fire years like 2003 should start to recur at shorter intervals, then what? ¹⁵⁸

Uncertainties arising from climate change paralleled and even compounded uncertainties arising from other, more immediate and direct human influences on the Crown of the Continent Ecosystem, such as economic development, population growth, and landscape fragmentation. The goal of ecosystem management was to treat social, economic and ecological factors holistically, to treat the natural world and the cultural landscape as overlapping and interdependent systems. As land managers acquired more experience with ecosystem management, they gained a greater appreciation of uncertainty. With the growing attention given to climate change and its implications for future land management, the role of uncertainty in ecosystem management loomed even larger. The response to uncertainty was “adaptive ecosystem management” or simply “adaptive management” or “AM.”¹⁵⁹

Dan Fagre and Tony Prato described AM as “a science- and information-based approach that is well suited for managing natural resources for climate and landscape change.” Like the I&M Program, it employs the scientific method in modeling, experimenting, and hypothesis testing. Just as I&M makes adjustments to management strategies and monitoring protocols based on new knowledge gained from monitoring, so too does AM make adjustments to mitigation and adaptation strategies based on monitoring inputs that are built into those management actions. And like its parent

¹⁵⁸ Divoky interview.

¹⁵⁹ Tony Prato, “Adaptive Ecosystem Management,” in Prato and Fagre, eds., *Sustaining Rocky Mountain Landscapes*, 249-52.

concept, ecosystem management, the goal of AM is to foster ecosystem stability and institutional flexibility through consensus building and collaborative decision-making.¹⁶⁰

In 2010, Glacier National Park was on the cusp of undertaking adaptive management to cope with climate change. At a climate change workshop held in the park during the winter of 2009-10, resource managers engaged in “scenario planning,” or AM based on various models of Glacier’s climate future. Jack Potter described it as an unveiling of “phase two” for climate change science in the Crown of the Continent Ecosystem: henceforth, the resource manager would put the question to the scientist, how should this information be applied? The thrust of the workshop was to change the focus from demonstrating the effects of climate change to helping managers make decisions about how to respond to it. For example, if the park should continue seed collection and propagation of whitebark pine, it was now time to ask the climate change scientist: where should the park plant the seedlings?

Resource managers appeared to be entering a new phase in the park’s history. Possibly they were feeling their way toward another paradigm shift such as had occurred in the park before: in the early 1930s with the rise of ecological thinking, in the 1960s in the wake of the Leopold Report, and in the 1990s when the Crown of the Continent Ecosystem concept took hold.

¹⁶⁰ Tony Prato and Dan Fagre, “Coping with Climate Change,” October 2006, copy of online article provided by Dan Fagre.

Conclusion

Preserving Different Natures



The history of resource

management in Glacier National Park is characterized by both change and continuity. This report highlights change in the form of four successive metaphors for nature, each one being a distillation of a distinct set of values and ideas: (1) the park as a *reservoir* or place for stocking game and fish, (2) the park as *sanctuary* for the protection of all native species in their natural habitat, (3) the park as *relic* or vignette of primitive America, and (4) the park as part of an *ecosystem* managed on the basis of interagency cooperation, citizen participation, and the principle of sustainability. These different metaphors for nature each shaped resource management in Glacier for an extended period. A turnover of resource management philosophy occurred roughly every 20 to 30 years.

Meanwhile, certain issues persisted, cutting across those chronological breaks and changes in philosophy, belying the profound continuity that was also part of the history of resource management in Glacier. Early park administrations focused on the protection of forests, wildlife, and fish, and those concerns remained paramount through most of the park's history. Bear management loomed large from the 1940s to the present. External threats were a constant concern and caused park managers to focus disproportional attention on two sides of the park, the North Fork Valley and the long eastern boundary with the Blackfeet Reservation. Since the report is organized in chronological chapters

that highlight change, a few concluding paragraphs are now in order to bring out these underlying elements of continuity.

Resource management in Glacier National Park was conditioned by the need to develop the area for tourism and recreation. In Glacier's establishing act, Section 2, Congress charged the Secretary of the Interior with "preservation of the park in a state of nature *so far as is consistent with the purposes of this act*" (emphasis added). The qualification at the end of that phrase was in reference to the Secretary's first charge, in Section 1 of the Act, to manage the area "as a public park or pleasure ground for the benefit and enjoyment of the people of the United States." These two distinct aims set up the famous "dual mandate" for Glacier. The dual mandate was carried forward in the National Park Service Act of 1916, and presented a perplexing challenge at the root of all national park administration. Over the course of the century Glacier's managers sometimes shifted emphasis from one side of the dual mandate to the other, but resource management was always carried out within the framework of providing a proper balance between preservation and use.

Recreational use of the area had a profound influence on the protection and management of park waters. For much of the park's history, the desire to provide good recreational fishing trumped resource managers' concerns about protecting native fish species. Even after the emphasis shifted toward the preservation of natural conditions, exotic fish species remained firmly lodged in park waters. The tension between preservation and use still bedevils resource management decision making today – inhibiting efforts, for example, to impose tighter restrictions on boat use of upper Lake McDonald that were deemed necessary for the protection of sensitive species.

Another element of continuity in Glacier's resource management history is the legacy of Indian dispossession, or what might be termed the "Euro-centrism" that is embedded in park protection efforts. From the time of Glacier's establishment to the present, the vast majority of park visitors were Euro-Americans (white people of mostly European ancestry). They held attitudes toward nature that were steeped in the American ideal of wilderness. Glacier's mountains represented not a homeland to them – as it did to the Blackfeet – but a remnant of the unsettled continent that had once drawn American civilization westward. The wilderness ideal pictured the Glacier wilderness as mythic, open and unclaimed, and iconic of the nation's westward experience. Therefore, as park managers sought to preserve Glacier in a state of nature, and to provide for public enjoyment through a finely-balanced development of frontcountry and backcountry areas, their task consisted largely of protecting those Euro-centric wilderness values. This made the Blackfeet relationship to Glacier National Park problematic. As long as Blackfeet

Indians dressed in traditional costume and posed as figures out of a romantic Western past, welcoming tourists who came to Glacier onboard the Great Northern Railroad, then the Blackfeet tribe enjoyed a conspicuous role in the park. But when the tribe asserted rights to land or resources within the park, based on the tribe's interpretation of the Agreement of 1895, park managers strongly opposed it.

Euro-centrism also posed a problem for park managers concerned with identifying a baseline for defining a pristine state of nature in Glacier. George M. Wright proposed that resource managers should research what conditions had been like when the first Euro-American settlers arrived in the area. The Leopold Report followed in the same vein, boldly proposing that resource managers restore those past ecological conditions as nearly as possible in order to recreate a vignette of primitive America. In 1992, Cliff Martinka still described Glacier in Euro-centric terms, even as he hailed a new approach to resource management based on the concept of a sustainable ecosystem. "In less than a century," Martinka noted, "GNP has been transformed from a scenic frontier sanctuary to what is now little more than a relict of the western wilderness."¹ Although ecosystem management shifted the focus away from preserving or restoring historical conditions and put the emphasis on maintaining ecosystem function instead, the Euro-centric view of the Glacier wilderness as historical vignette continued to hold strong appeal down to the present day.

External threats were another constant in Glacier's resource management. Park managers wanted the park boundaries to be hard or inviolable and found them instead to be incredibly porous. In the early days, poachers entered the park with relative ease. By the 1930s, park managers were nearly as concerned with poaching outside of the park, because they recognized that most of the park's big animals moved in and out of the park seasonally and required protection by the state during the winter months. In the 1970s, concern shifted to the grizzly bear as resource managers insisted that Glacier did not contain a sufficient amount of habitat by itself to sustain a viable population of grizzly bears. Throughout these decades, resource managers also confronted the fact that forest fires did not stop at the park boundary, and that state-managed fisheries in the Flathead River Basin extended upstream into park waters. By the 1980s, Glacier faced actual or potential threats from hydroelectric projects, mining, oil and gas leasing, and air pollution, all emanating from outside the park.

¹ Martinka, "Conserving the natural integrity of mountain parks: Lessons from Glacier National Park, Montana," 47.

External threats were common to all national parks, but Glacier faced more than most. In an effort to describe a buffer zone around the park, resource managers adopted the concept of the Greater Glacier Ecosystem. The Greater Glacier Ecosystem brought Glacier together with an extraordinary number and diverse group of neighbors: Waterton Lakes National Park, two national forests, two Indian reservations, BLM lands, private lands, the State of Montana, and two Canadian provinces.

As Glacier marks its centennial year, it is tempting to try to imagine what mix of change and continuity is in store for Glacier in its second century. Resource managers are restive over the uncertainties and potential implications of climate change.

Ecosystem management is now some 20 to 30 years old. Efforts to protect the grizzly bear, a driver for ecosystem management since the early 1980s, is nearing a milestone when the grizzly bear may be deemed “recovered” under the terms of the Endangered Species Act. Research and monitoring of two park resources – grizzly bears and white bark pine – has recently advanced from the population to the genetic level. Are these seemingly futuristic developments the signs of an impending turnover in philosophy like those we have seen in the past?

Of the four different natures that framed resource management efforts during the park’s first century, the first three had one important feature in common: they all emphasized how the national park was distinct and set apart from all other land classifications. In the early years, Glacier was different from surrounding areas because it brought federal police power to bear on wildlife protection. In the 1930s, Glacier was different because a national park, in contrast to a national forest, afforded complete sanctuary for *all* native species, predators and game animals alike. In the era that commenced with the Leopold Report, Glacier was different because it stood apart from the multiple-use form of land management that was increasingly in evidence all around: Glacier was to serve as a vignette of primitive America. It is only in the most recent conception of nature that Glacier is perceived not as an area set apart, but as an area firmly bound to its neighbors within the larger bioregion now known as the Crown of the Continent Ecosystem. Regional ecosystem management is predicated on the idea that ecosystem processes extend across political boundaries, making interagency cooperation imperative. In the long run, adoption of the bioregion idea may be the most remarkable change in Glacier’s first century of resource management. Whether it ultimately strengthens or weakens the park’s defenses in the next century, only time will tell.

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