

March 2008

# YELLOWSTONE BISON

## Interagency Plan and Agencies' Management Need Improvement to Better Address Bison- Cattle Brucellosis Controversy





Highlights of [GAO-08-291](#), a report to congressional requesters

## Why GAO Did This Study

Federal and Montana state agencies have long been entangled in controversy over bison leaving Yellowstone National Park. Some of these bison, as well as elk and other wildlife, have a contagious disease called brucellosis, which can cause pregnant animals to abort. Montana livestock owners and government officials fear that if bison are allowed to leave the park, the disease could spread to cattle, potentially threatening the economic health of the state's livestock industry. To help manage this issue, three federal and two state agencies have been implementing a bison management plan that they agreed to in 2000.

This report discusses (1) the progress made in implementing the bison management plan and (2) the plan's soundness and the effectiveness of the agencies' implementation of it for managing bison-related issues in and near Yellowstone National Park. GAO reviewed documentation and research on bison and brucellosis and interviewed federal and state officials and key stakeholders.

## What GAO Recommends

GAO is recommending that Agriculture and Interior—with the Montana state agencies—improve their accountability, transparency, and management of Yellowstone bison by developing measurable objectives and reporting yearly on progress, among other actions. The agencies, except for Montana Fish, Wildlife and Parks that provided no comments, generally concurred with GAO's recommendations.

To view the full product, including the scope and methodology, click on [GAO-08-291](#). For more information, contact Robin M. Nazzaro at (202) 512-3841 or [nazzaror@gao.gov](mailto:nazzaror@gao.gov).

## YELLOWSTONE BISON

### Interagency Plan and Agencies' Management Need Improvement to Better Address Bison-Cattle Brucellosis Controversy

#### What GAO Found

The federal and state agencies implementing the interagency bison management plan have made less progress than they originally anticipated. These agencies—the U.S. Department of Agriculture's Animal and Plant Health Inspection Service and Forest Service; the Department of the Interior's National Park Service; Montana Fish, Wildlife and Parks; and the Montana Department of Livestock—had expected to progress to step two of the three-step plan by winter 2002–2003. Each of the plan's three successive steps for managing bison is intended to incrementally increase tolerance of bison roaming outside the park. As of late 2007, however, the agencies remained in step one because they have yet to meet two important conditions for moving to step two—first, that no cattle graze on a ranch north of the park, and second, that a safe and effective remote brucellosis vaccine-delivery system be available for bison. Nevertheless, the agencies have completed a number of other tasks called for in the plan, including maintaining the separation of bison and cattle in space and time and conducting some scientific research. Combined, the agencies have spent more than \$2 million annually implementing the plan, with the federal government and state agencies funding about 95 percent and 5 percent of these expenditures, respectively. The agencies have no estimate regarding how long it will take to meet the conditions for starting step two, nor have they revised their estimated dates for reaching step three, which was expected by winter 2005–2006.

Key deficiencies in the plan, and the agencies' implementation of it, limit their effectiveness with regard to managing bison-related issues. The plan has two broadly stated goals: to “maintain a wild, free-ranging population of bison and address the risk of brucellosis transmission.” The plan, however, contains no clearly defined, measurable objectives as to how these goals will be achieved, and the partner agencies have no common view of the objectives. As a result, the agencies have no way to determine the effectiveness of the plan or of their management efforts. Also, in developing the plan, the agencies adopted an adaptive management approach that promotes flexible decision making in the face of uncertainties as outcomes from management actions and other events become better understood. But the agencies have not adequately implemented adaptive management, in that they (1) have not established critical linkages among clearly defined objectives (which are absent from the plan), information about the impacts of their management actions obtained through systematic monitoring, and decisions regarding adjustments they make to the plan and their management actions; (2) have continued to act more as individual entities, rather than as a cohesive interagency group; and (3) have not adequately communicated with or involved key stakeholders, such as conservation groups, livestock industry groups, and private landowners. Consequently, their decision making more often resembles trial and error than adaptive management and also lacks accountability and transparency.

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United States Government Accountability Office  
Washington, DC 20548

March 7, 2008

The Honorable Nick J. Rahall, II  
Chairman  
Committee on Natural Resources  
House of Representatives

The Honorable Maurice D. Hinchey  
House of Representatives

Long symbolic of the vastness of North America's plains, American buffalo, or bison, today roam freely only in a few places, including Yellowstone National Park. The park lies at the heart of the Greater Yellowstone Area, which overlaps portions of Idaho, Montana, and Wyoming and encompasses two national parks, six national forests, and several national wildlife refuges and wilderness areas. Outside the two national parks, privately owned lands are interspersed throughout these federal lands, including the Royal Teton Ranch, which, as we previously reported, has been a focus of federal land conservation efforts near the park since the late 1990s.<sup>1</sup> The park's herd—which has grown from fewer than 25 bison in 1901 to nearly 5,000 animals as estimated in late summer 2007—is the largest free-ranging bison herd in the United States and one of the few U.S. herds that show no evidence of genetic mixing with cattle. As their population has grown and they have roamed beyond the park's boundaries onto surrounding private and public lands in Montana, Yellowstone bison have been at the center of a controversy that has raged for more than two decades.

Throughout the winter and early spring, tens, sometimes hundreds, of bison move naturally between Yellowstone National Park and adjacent public and private lands, some of which may also be used by livestock owners to graze cattle. Some of the bison, as well as elk and other wildlife in and around the park, harbor a contagious and untreatable disease, brucellosis, which can cause pregnant animals to abort their calves. Fears of this disease and differing wildlife management philosophies have

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<sup>1</sup>GAO, *Yellowstone National Park: Preliminary Observations on the Implementation of the Interagency Bison Management Plan*, [GAO-07-638T](#) (Washington, D.C.: Mar. 20, 2007).

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contributed to the long-running controversy. Specifically, many ranchers and some of the federal and state officials responsible for brucellosis management believe that if wildlife poses a disease transmission risk to cattle, it is the diseased wildlife that should be the focus of management efforts. Some conservationists, in contrast, argue that ranchers and government agencies should strengthen disease mitigation and management efforts within the livestock industry, such as limiting livestock grazing on national forest lands near the park, vaccinating cattle, or improving fencing of cattle herds. Moreover, while brucellosis-infected bison and elk in Montana both present a risk to the cattle industry, bison have historically been subject to strict disease-control measures, including slaughter when they attempt to leave the national park, whereas elk—which have a lower incidence of brucellosis but are more numerous than bison—are allowed to roam with relatively few restrictions. No known cases of brucellosis transmitted from bison to cattle have been documented in the wild and some conservationists point to this fact to suggest that current bison management actions are unnecessary. In contrast, Montana’s State Veterinarian maintains that this absence of documentation does not indicate a low risk of transmission, but rather provides evidence that the various park boundary control programs to manage Yellowstone bison have been effective. Furthermore, Montana livestock owners and government officials fear that if such a transmission did occur, the economic consequences to the state’s livestock industry could be devastating. A brucellosis infection identified in a single cattle herd in Bridger, Montana, in May 2007 underscored rancher’s fears. While the source of the infection has not been determined, the Montana Department of Livestock indicated that the infection was unlikely to have come from bison.

In an effort to begin defusing this controversy, five federal and state agencies—the Forest Service and the Animal and Plant Health Inspection Service (APHIS), within the U.S. Department of Agriculture; the National Park Service (Park Service), within the Department of the Interior; and Montana Fish, Wildlife and Parks as well as the Montana Department of Livestock—agreed in the early 1990s to develop a joint, long-term bison management strategy. Under different mandates and authorities, these agencies all have some jurisdiction over the bison management effort. The Park Service is responsible for resources—both habitat and wildlife—within the park’s boundaries. Outside the park in Montana, the Forest Service manages habitat on national forest lands, while the state’s Fish, Wildlife and Parks is responsible for managing habitat on some state-owned lands and wildlife on all lands, including national forest lands. In addition, because of concern over the risk that brucellosis-infected bison

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may pose to the livestock industry, the Montana state legislature in 1995 granted the Department of Livestock the authority to take certain actions on public or private land with respect to bison originating from the park, including removing or destroying them. APHIS is responsible for controlling and preventing the spread of communicable and contagious diseases of livestock, including brucellosis. Since APHIS first instituted a national brucellosis control program in 1934, billions in federal, state, and industry funds have been spent trying to eradicate the disease from cattle across the nation. As of February 2008, APHIS announced that for the first time in the 74-year history of the brucellosis control program, all 50 states have been declared brucellosis free.

Efforts to develop a long-term bison management strategy in the early 1990s were slow, largely because of the five agencies' differing wildlife management philosophies. The Park Service opposed efforts to manage bison in any way that would restrict the animals' ability to roam freely and thereby go against the park's policy to manage wildlife by natural regulation—a policy that allows factors such as climate, food supply, and predation to regulate most wildlife populations in the park. During that period, however, APHIS, which is committed to eradicating brucellosis in the United States, argued that wildlife should be tested for exposure to the disease and, if infected, slaughtered to prevent its spread. In 1995, Montana sued the Park Service and APHIS, fearing that the federal agencies' conflicting wildlife management policies might cause APHIS to downgrade the brucellosis classification of Montana's livestock, which has been certified since 1985 to be free of brucellosis. Under APHIS's brucellosis eradication program, a classification downgrade could result in significant economic consequences to both individual herd owners and the state. For example, a downgrade could restrict the state's livestock producers' access to interstate and international markets. To settle Montana's lawsuit, the federal and state governments agreed to develop interim bison management procedures and an environmental impact statement for managing bison long term.<sup>2</sup> In 1996, the agencies began implementing an interim bison management plan, which resulted from the settlement agreement. After four more years of mediated negotiations—nearly a decade after joint planning efforts began—an interagency bison

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<sup>2</sup>Under the National Environmental Policy Act of 1969, agencies evaluate the likely environmental effects of projects they are proposing using an environmental assessment or, if the projects are likely to have a significant effect on the environment, a more detailed document known as an environmental impact statement.

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management plan for the Yellowstone bison was agreed upon by the five federal and state partner agencies in December 2000.<sup>3</sup>

The agreed-upon plan includes three successive steps for managing bison on the northern and western boundaries of Yellowstone National Park in areas to which some bison typically attempt to migrate in the winter and early spring. The plan's two stated purposes, or goals, are to "maintain a wild, free-ranging population of bison and address the risk of brucellosis transmission to protect the economic interest and viability of the livestock industry in Montana." Although managing the risk of brucellosis transmission from bison to cattle runs throughout the bison management plan and the plan's outlined management actions demonstrate the agencies' long-term commitment toward eventually eliminating brucellosis in Yellowstone bison, the plan itself does not seek to eliminate brucellosis in bison. Instead, through its successive management steps, it aims to create and maintain separation between bison and cattle in space and time that is sufficient to minimize the risk of brucellosis transmission. Ultimately, each step of the plan is intended to incrementally increase tolerance for bison to roam outside the park. For example, under step two, up to 100 bison testing negative for exposure to brucellosis will be allowed to migrate to a bison management zone outside the park's northern boundary, where they are prohibited before step two is reached. When step three is fully implemented, the same number of bison will be allowed to pass into this same zone but will not have to be tested beforehand. Even under step three, however, the plan calls for management actions, including driving bison toward the park's interior (hazing),<sup>4</sup> and capturing those that do not remain inside to prevent more than 100 bison from exiting the park into this bison management zone. The captured bison testing positive for brucellosis would be sent to slaughter while the bison testing negative may be returned to the park, sent to a bison quarantine facility, sent to slaughter, or removed for approved research.

Given the uncertainties regarding brucellosis and bison behavior at the time that the partner agencies were crafting their bison management plan,

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<sup>3</sup>The interagency bison management plan is included as part of the federal *Record of Decision for Final Environmental Impact Statement and Bison Management Plan for the State of Montana and Yellowstone National Park*. For purposes of this report, we refer to this combined document as "the plan," unless otherwise specified.

<sup>4</sup>To haze bison is to drive them away from a facility or location by means of horseback, all-terrain vehicle, helicopter, or other methods.



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the agencies adopted an adaptive management approach—one that would allow them to modify the plan as better information became available through scientific research and operational experience. According to adaptive management experts, this approach enables managers to operate in the face of uncertainty and to learn by doing, thereby leading to improved understanding and more-effective management over time.<sup>5</sup> In principle, learning in an adaptive management setting involves systematically testing—either operationally, scientifically, or both—different management alternatives to gain knowledge. The alternatives are developed on the basis of the best information available at the time, and, as management proceeds, techniques that do not work are modified or replaced by others. Adaptive management shares a number of key features with best management practices—such as those articulated in the Government Performance and Results Act of 1993 and the Comptroller General’s 2004 forum on high-performing organizations<sup>6</sup>—including identifying clearly defined, measurable, and results-oriented management objectives; designing and implementing a monitoring plan; making decisions based on management objectives; effectively managing partnerships while maintaining accountability to Congress and the public; and actively involving key stakeholders over time to engender public support.

In this context, this report discusses (1) the progress made in implementing the interagency bison management plan and (2) the soundness of the plan and the effectiveness of the agencies’ implementation of it with regard to managing bison-related issues in the Greater Yellowstone Area.

To address these objectives, we interviewed officials from the Park Service; Forest Service; APHIS; Montana Fish, Wildlife and Parks; and the Montana Department of Livestock to obtain information about the progress the agencies have made in implementing the interagency bison

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<sup>5</sup>C. S. Holling, ed., *Adaptive Environmental Assessment and Management* (New York: John Wiley and Sons, 1978); K. N. Lee, *Compass and Gyroscope: Integrating Science and Politics for the Environment* (Washington, D.C.: Island Press, 1993); Kimberly J. Reeve Morghan et al., “Successful Adaptive Management—The Integration of Research and Management,” *Rangeland Ecology and Management*, vol. 59, no. 2 (2006); and C. Walters, *Adaptive Management of Renewable Resources* (New York: Macmillan, 1986).

<sup>6</sup>Government Performance and Results Act of 1993, Pub. L. No. 103-62, 107 Stat. 285 (1993), as amended, and GAO, *Comptroller General’s Forum: High-Performing Organizations*, [GAO-04-343SP](#) (Washington, D.C.: Feb. 13, 2004).

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management plan. We collected and reviewed available documentation of agency management practices, accomplishments, and expenditures related to bison and brucellosis management and recent scientific research on various topics related to brucellosis and wildlife, including the safety and effectiveness of brucellosis vaccines and available tools for diagnosing the disease. To obtain a wide range of perspectives on the federal and state agencies' implementation of the plan, we also interviewed numerous individuals from key stakeholder constituencies, including conservationists, livestock industry representatives, local ranchers, permittees of public livestock grazing allotments, Native American tribes, hunting enthusiasts, lessees of private land, and other private landowners. Appendix I presents a more detailed description of our objectives, scope, and methodology. We conducted this performance audit from January 2007 through March 2008 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Results in Brief

Since the interagency bison management plan took effect in 2000, the partner federal and state agencies have made less progress than they anticipated in implementing the plan. Each successive step of the three-step plan details various management actions that are intended to incrementally increase tolerance for bison roaming outside the park. As of December 2007, the agencies remained in step one of the plan, even though they had expected to move to step two of the plan by winter 2002–2003. The agencies have yet to meet two important conditions for advancing to step two. First, before step two may begin, the plan requires that cattle no longer graze in the winter on lands north of the park belonging to the Royal Teton Ranch; as of December 2007, negotiations between Montana Fish, Wildlife and Parks and ranch owners to end cattle grazing on these lands were still in progress. Second, the plan requires development of a safe and effective remote brucellosis vaccine-delivery mechanism for bison allowed in the West Yellowstone area. The Park Service expects to release its evaluation of remote delivery methods for use within the park for public comment in summer 2008. Although the partner agencies remain in step one, they have carried out a number of other tasks called for in the plan. For example, the agencies have implemented management actions to keep bison separate from cattle in space and time; conducted some scientific research on brucellosis; verified the safety of a brucellosis vaccine in bison, and vaccinated a

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limited number of bison calves and yearlings on a limited basis; and taken steps to ensure the vaccination of all cattle within certain areas close to the park's northern and western boundaries. Since 2002, the federal and state partner agencies have spent more than \$2 million annually to implement the plan, with the federal government and state agencies funding about 95 percent and 5 percent of these expenditures, respectively. Meanwhile, according to partner agency officials, the agencies have no estimated time frame for completing the remaining two conditions for moving into step two of the plan or for reaching step three, which they had expected to reach by winter 2005–2006, leaving the expected date for full implementation of the plan unknown.

Key deficiencies in the plan, and the agencies' implementation of it, limit the agencies' effectiveness in managing bison-related issues. According to general best management practices and adaptive management principles, clearly defined, measurable objectives are needed to provide a sound basis for selecting and monitoring management actions, triggering changes to those actions, and determining the effectiveness of the plan. The plan, however, does not have clearly defined, measurable objectives, and the partner agencies share no common view of the objectives. In fact, several agency officials acknowledged that no metrics or parameters have been identified for measuring how well the agencies are meeting the plan's stated goals. In addition, the partner agencies have not fully implemented an adaptive management approach because they (1) have not established critical linkages among clearly defined objectives (which are absent from the plan), information about the impacts of their management actions obtained through systematic monitoring, and decisions regarding adjustments they make to the plan and their management actions; (2) have continued to operate more as individual entities than a cohesive interagency group; and (3) have not adequately communicated with or involved key stakeholders.

We recommend that the Secretaries of Agriculture and the Interior direct the federal partner agencies to work with their state agency partners to improve the management of bison in and near Yellowstone National Park by, for example, clearly defining measurable objectives, and to enhance the agencies' collaboration and accountability to the public on this issue, including annually reporting on the agencies' progress.

We provided the federal departments of Agriculture and the Interior and Montana's Fish, Wildlife and Parks and Department of Livestock a draft of this report for review and comment. In written comments, the Department of Agriculture, the Department of the Interior, and the Department of

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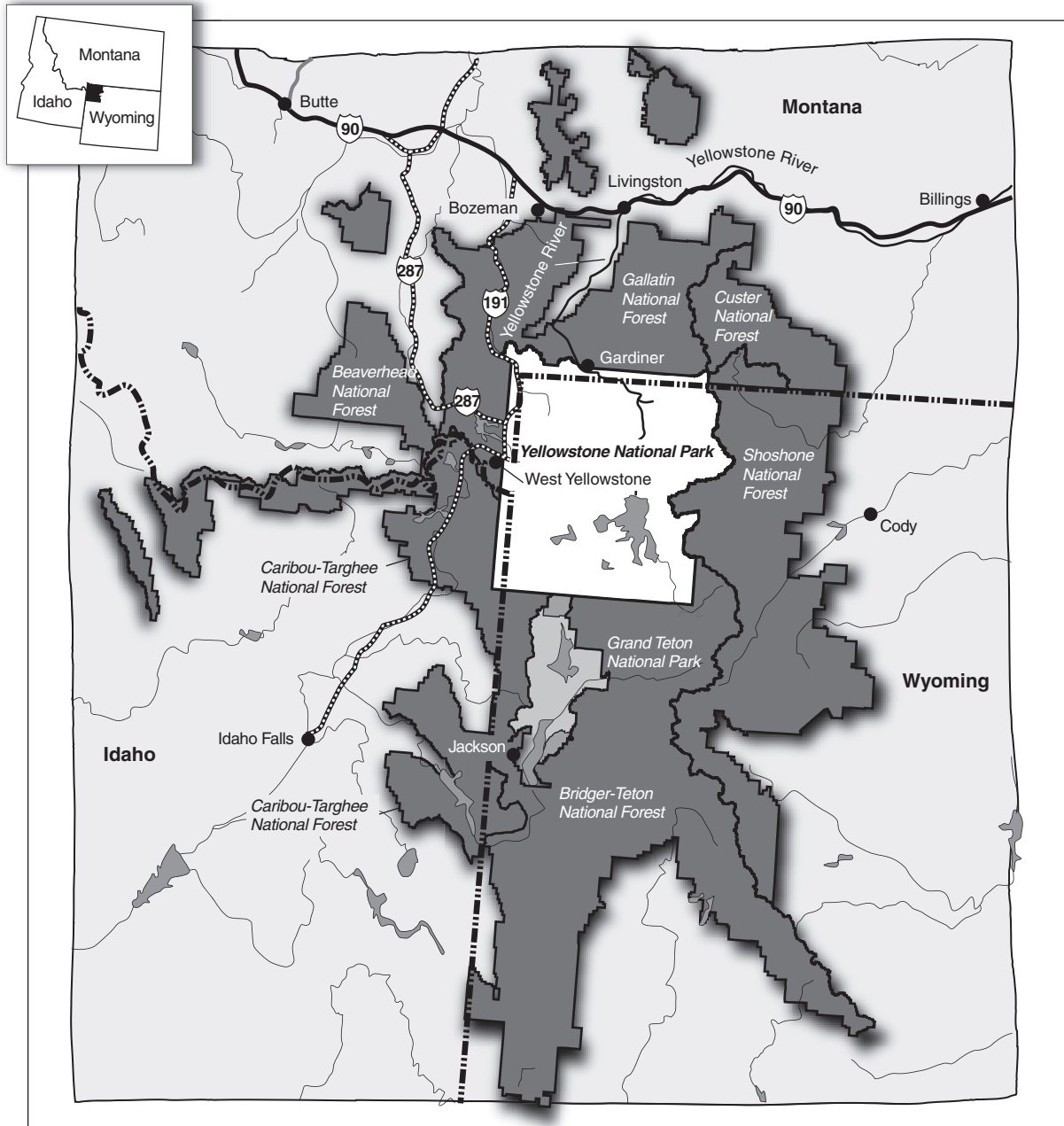
Livestock generally agreed with our conclusions and recommendations (see apps. II, III, and IV, respectively). Montana Fish, Wildlife and Parks provided no comments on our report.

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## Background

The greater Yellowstone region covers about 20 million acres overlapping Idaho, Montana, and Wyoming. Commonly called the Greater Yellowstone Area, Greater Yellowstone Ecosystem, or just Greater Yellowstone, the region is home to numerous species of wildlife, including bison. It encompasses two national parks—Yellowstone and Grand Teton—as well as several other federally managed areas, including the Gallatin, Custer, Shoshone, Bridger-Teton, Caribou-Targhee, and Beaverhead national forests; the National Elk Refuge; and the John D. Rockefeller, Jr., Memorial Parkway. Privately owned lands, including the Royal Teton Ranch north of Yellowstone National Park and west of the Yellowstone River, are interspersed throughout these federal lands, and a number of towns dot the landscape (see fig. 1). The Greater Yellowstone Area has also earned the distinction, according to APHIS, of being the nation’s last known reservoir of the brucellosis bacterium, *Brucella abortus*, which is present in the region’s bison and elk populations.

**Figure 1: The Greater Yellowstone Area**

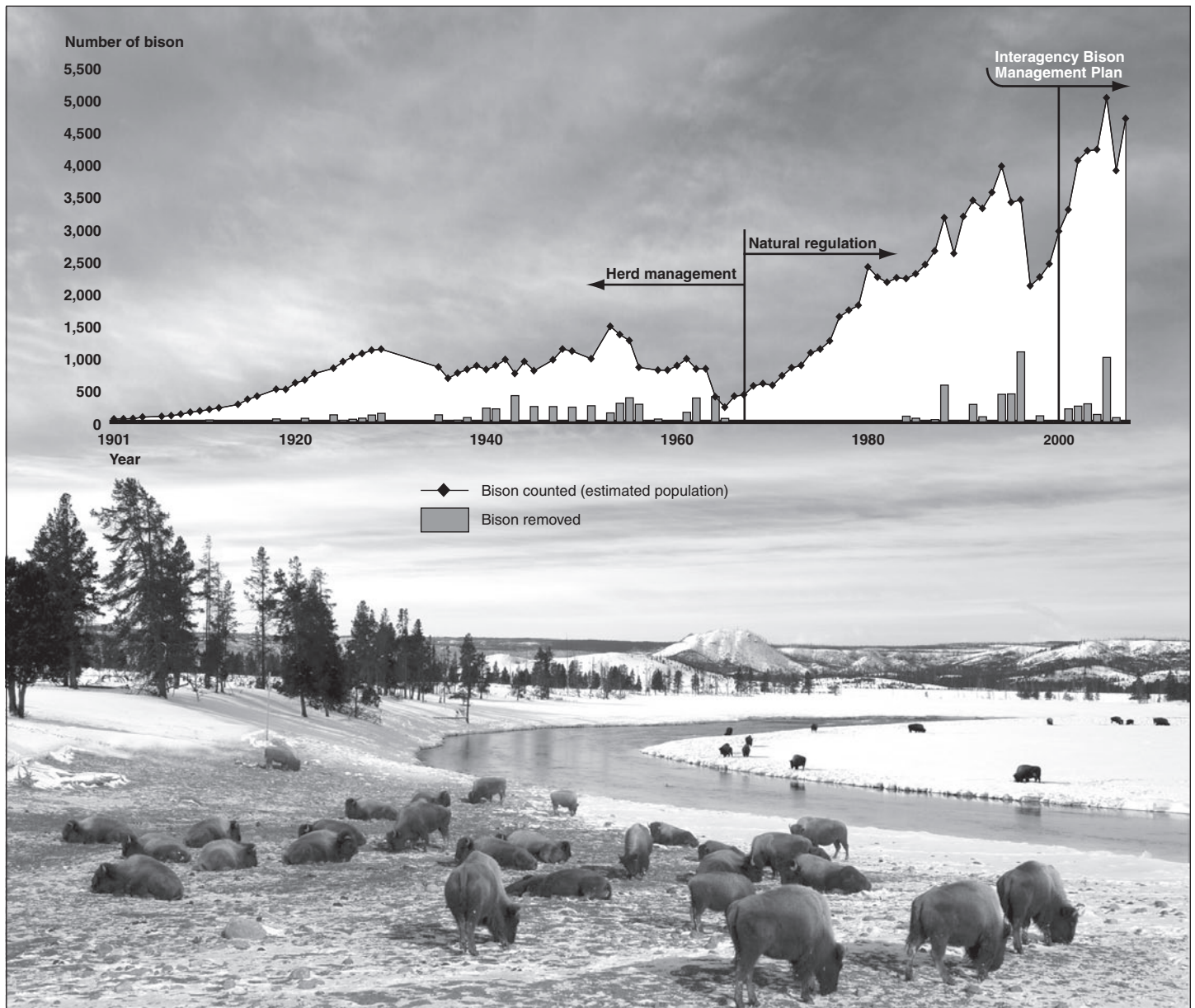


Source: GAO image developed from National Park Service data.

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Bison, which are native to the Greater Yellowstone Area, were observed by early travelers both before and after Yellowstone National Park was created in 1872. Bison hunting and poaching in the late 1800s substantially diminished the Yellowstone herd, and, by 1901, fewer than 25 animals remained (see fig. 2). To save this wild herd from extinction, park managers in 1902 imported 21 bison from captive herds in Texas and Montana. Although the wild and captive herds were initially kept separate, they began to intermingle between 1915 and 1920, and after the 1920s, little or no effort was made to keep the two populations separate. By the 1930s, the park's wintering bison had increased to more than 1,000 head, and the park began managing the herd by shipping animals to public parks, zoos, and private estates around the country. From the 1920s through the late 1960s, the bison herd was managed through culling, supplemental feeding, and other activities until the park instituted a policy of natural regulation of wildlife populations, whereby a species' population size is left to respond to environmental conditions like climate or food supply without human interference. By the early 1980s, the bison herd had grown to more than 2,300 head, and bison were increasingly reported moving beyond the park's boundaries into Montana. During the mid-1980s through 1999, a total of 3,176 bison that crossed outside the park's northern or western boundaries were killed, under a series of park boundary area management approaches implemented by the Park Service and Montana. Since 2000, boundary area management action by federal and state agency officials have lethally removed more than 1,900 bison, but the herd has continued to grow, with nearly 4,700 head counted in late summer 2007.

**Figure 2: Estimated Population of Yellowstone Bison since 1901**



Source: GAO analysis of National Park Service data; photo GAO.

Bison, as well as wildlife such as elk, may carry the bacterial disease brucellosis, which is also contagious to humans and domestic animals. Known in humans as undulant fever, brucellosis can be hard to diagnose

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because early symptoms, such as intermittent fever and joint pain, are shared with several other diseases; although rarely fatal, the disease can be debilitating. However, thanks to widespread pasteurization of dairy products since the early twentieth century, very few cases of undulant fever have occurred in the United States, and the disease today poses a risk mainly to hunters, large-animal veterinarians, and ranchers. In some animals, including cattle, the disease can cause abortions, infertility, reduced milk production, lameness, and swollen joints. In the Yellowstone area, bison and elk are the disease's principal wildlife hosts. Results of blood tests done by the Park Service over the past several decades indicate that about half of the Yellowstone bison have been exposed to brucellosis. Some bison may develop immunity or have a natural resistance to the disease, while other animals may develop recurrent infections and remain carriers and a source of exposure and possible infection for other animals.

The first known case of brucellosis in Yellowstone bison was reported in 1917 and is believed to have been transmitted from domestic cattle. Transmission occurs primarily through ingestion of infected products of birth or abortion. As a result, the risk of transmission is greatest if cattle and bison are in each other's presence immediately after birthing. Although vaccinating cattle provides some protection, it does not eliminate the infection risk, as evidenced since 2004 by instances of brucellosis transmission from infected wildlife to vaccinated cattle in Idaho and Wyoming. Within the scientific community and among people interested in bison management, opinions differ about whether it is most appropriate to control or to eradicate the disease. Within the regulatory community, however, APHIS officials remain committed to establishing the means to suppress and eliminate contagious livestock diseases, including brucellosis.

Although both bison and elk carry brucellosis, the two species are managed differently by federal and state agencies. Yellowstone bison are subject to strict disease-control measures, ranging from capture and vaccination to slaughter, whereas elk herd movements are not restricted. Agency officials indicate that this difference in management approach stems largely from the lower prevalence of brucellosis in elk than in bison, combined with the tendency of elk to feed at higher elevations than bison



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and to calve in isolation, thereby lessening the risk of transmission.<sup>7</sup> This difference in management remains even though there have been multiple suspected elk-to-cattle transmissions in recent years in Idaho and Wyoming, some of which have been detected through DNA testing; the National Research Council reported in 1998 that the risk of transmission from bison to cattle was low; and there have been no known cases of brucellosis transmitted from bison to cattle in a wild, uncontrolled setting. APHIS scientists note, however, that although transmission in the wild is difficult to document—particularly given the decades-long effort to maintain separation between bison and cattle—controlled tests have proven that it is possible for bison to transmit the disease to cattle. We reported in 1997 that the extent to which domestic cattle risk infection through exposure to diseased bison and elk—either from mingling directly with infected wild animals or from using rangeland where infected wild animals had previously grazed—was the subject of the bison management controversy between the federal and state agencies because the risk of such transmission had not been quantified.<sup>8</sup> Scientists and researchers disagreed on even the most basic factors influencing the risk of transmission, such as whether studies on cattle are applicable to bison. Ten years later, such debates continue.

To keep bison away from cattle and mitigate the risk of brucellosis transmission, the interagency bison management plan describes agency activities to restrict bison movement to or through bison management zones within or just beyond the park's boundaries near Gardiner, Montana, on the north, and near West Yellowstone, Montana, on the west (see fig. 3).<sup>9</sup> During step one of the three-step plan, bison attempting to leave the park on the north side are to be hazed, captured, or killed, and a limited

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<sup>7</sup>According to the Montana Department of Livestock, management of the risk of brucellosis transmission from elk to cattle is being addressed through the Greater Yellowstone Interagency Brucellosis Committee, in which all of the partner agencies are represented.

<sup>8</sup>GAO, *Wildlife Management: Issues Concerning the Management of Bison and Elk Herds in Yellowstone National Park*, [GAO/T-RCED-97-200](#) (Washington, D.C.: July 10, 1997).

<sup>9</sup>The plan mentions certain Gallatin National Forest and private lands north and west of the park, such as the Eagle Creek/Bear Creek region and portions of the Lee Metcalf Wilderness as other management areas outside of the plan's designated bison management zones. Bison are allowed to graze in these other areas year-round without agency interference because cattle generally do not graze on these lands. If bison migrate out of the park and into one of these areas, agency officials are required to monitor them; if bison attempt to move beyond these areas, the plan requires agency officials to either keep them within those areas or slaughter them.

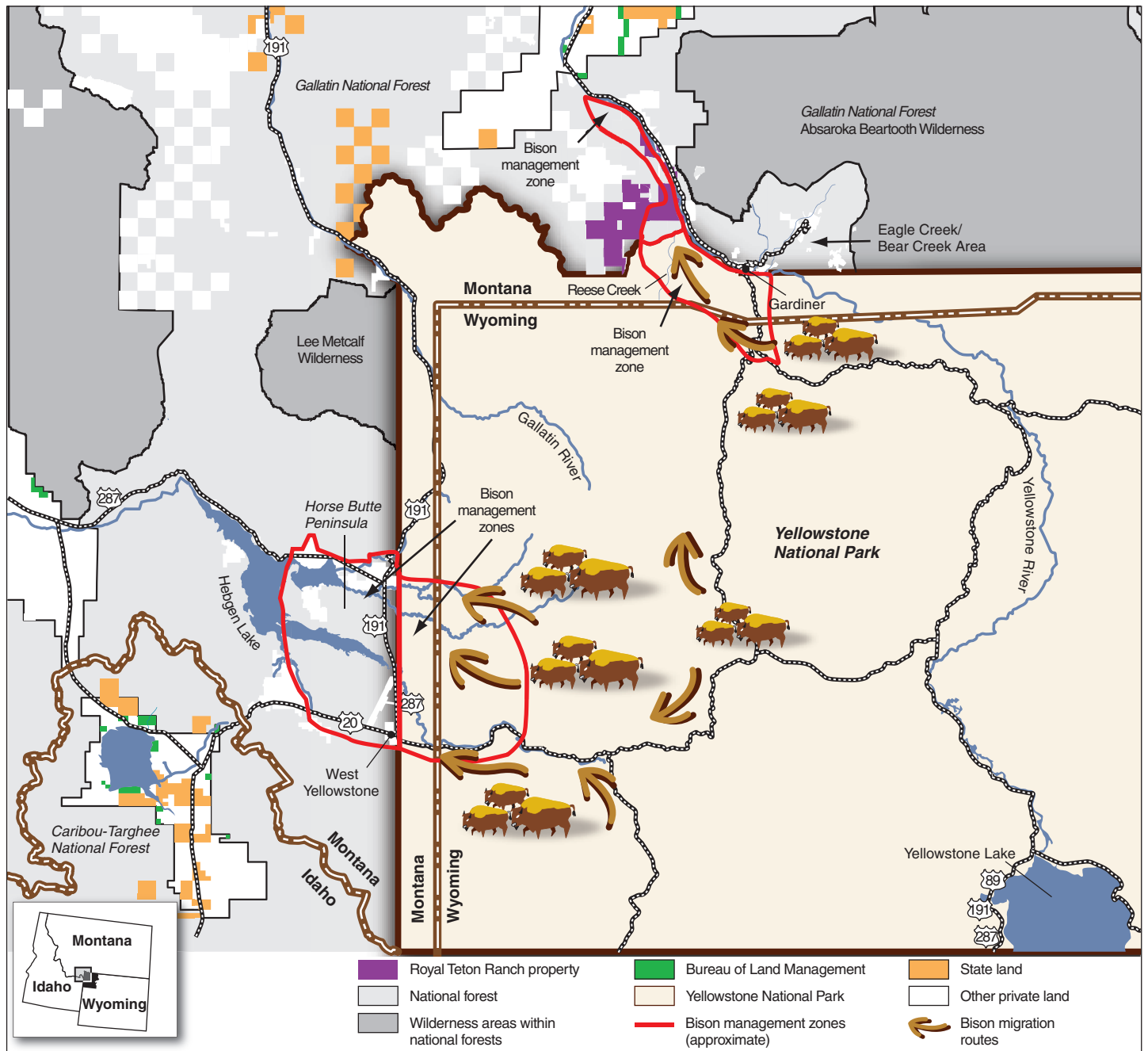
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number of bison on the west side of the park—as many as 100 animals—that test negative for brucellosis exposure are allowed to roam in bison management zones outside the park. Once this limit on the west side is reached, additional bison crossing beyond the western boundary are also to be hazed, captured, or killed. The plan states that all captured bison are to be tested for brucellosis exposure at capture facilities located on the park’s northern and western boundaries.<sup>10</sup> Partner agency officials may take a variety of actions with captured bison testing negative for exposure to the disease, including vaccinating and temporarily holding them in the northern capture facility for release back into the park or removing them for research. Bison that test positive for brucellosis exposure are generally to be sent to slaughter.

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<sup>10</sup>Current brucellosis tests involve determining whether a blood sample taken from an animal contains antibodies to the brucellosis bacterium. The presence of these antibodies indicates that the animal has been exposed to the bacterium in quantities sufficient to trigger antibody production but does not necessarily mean the animal is infected with, or ill from, the disease itself.

**Figure 3: Bison Management Zones Specified in the Interagency Bison Management Plan and Related Bison Migration Patterns**



Source: GAO image developed from National Park Service and Forest Service data.

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Under both steps two and three of the plan, the majority of bison must be prevented from leaving the park, and the few bison that are allowed to leave are generally to be restricted and monitored within the bison management zones and other management areas. Step two on the park's north side will allow up to 100 bison testing negative for brucellosis to be released into these bison management zones; pregnant females are to be monitored using radio telemetry, and all bison are to be hazed back into the park or otherwise removed by April 15 of each year. Under step two, on the park's west side, up to 100 bison that have not been tested will be allowed to exit the park, and officials are required to vaccinate these bison remotely; May 15 is the deadline for all bison to be back in the park. Similarly, in step three, an effective remote vaccination program must be operating in the park before up to 100 untested bison will be allowed out of the park into the bison management zones on both the north and west sides. However, except in a few locations, if more than 100 bison attempt to migrate beyond the park's northern and western boundaries, under step three they are to be hazed, captured, or killed. Many of the management actions specified in step one are to continue indefinitely, even when step three is fully implemented.

A brucellosis outbreak among domestic cattle in Montana would likely have the following direct effects: (1) abortion of calves, (2) decreased weight gain by calves, (3) delays in calf production, (4) increased rates of culling and replacement, and (5) increased testing and vaccination costs. Furthermore, the presence of the disease could also restrict access by the state's livestock producers to interstate and international markets, resulting in potentially severe economic impacts, particularly for producers of breeding stock. Under APHIS's brucellosis eradication program, if a single herd of livestock becomes infected, the infected animals are to be slaughtered, the herd quarantined or slaughtered, and the herds in the surrounding area tested to ensure that the disease does not spread. If no additional infections are found within 24 months, the state may retain its brucellosis-free status. If, however, an additional herd were found to be infected with brucellosis, the state's classification would be lowered, and additional interstate testing requirements would be imposed statewide. Because of the increased movement of potentially exposed or infected bison out of Yellowstone National Park, some states have threatened to require additional testing of any cattle entering their states from Montana and Wyoming. Such actions could have significant economic consequences to Montana's livestock industry if downgrading occurred, similar to those experienced by Idaho and Wyoming when their brucellosis certifications were downgraded after outbreaks in 2004 and 2005, respectively. By one calculation, Montana officials estimated that a

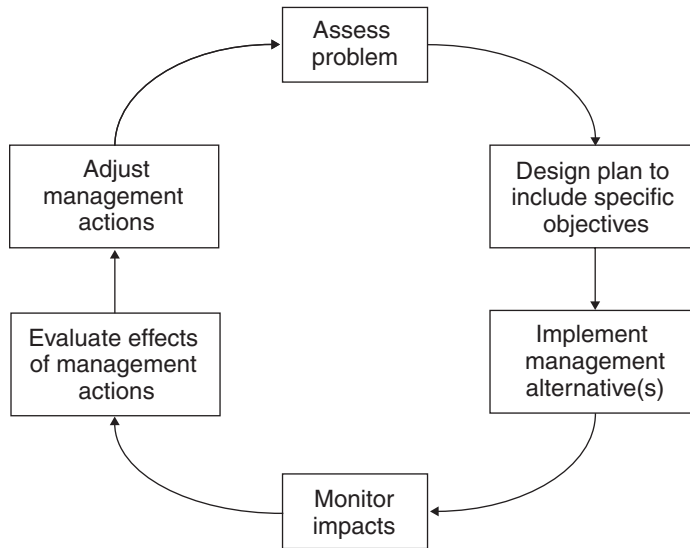
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downgraded status would have an annual economic impact on the state of at least \$4 million. However, these officials noted that this estimate was likely to be low because they considered only the cost of additional testing required for cattle—not other factors, such as increased operating costs, impacts on agricultural markets, or direct effects on producers. A more complex economic analysis conducted for the partner agencies showed potential annual economic impacts of the increased testing as high as \$16.3 million and, with a potential decrease in out-of-state demand, an estimated \$9.8 million to \$38.8 million decrease in the price of cattle.

Faced with complex issues like the bison-cattle brucellosis controversy, wildlife and natural resource managers have been increasingly encouraged to use an adaptive management approach as a way to work within a dynamic natural environment that has become complicated by people moving into and development within or near these areas. In addition, a move toward accountability and transparency in natural resource management, demanded by the general public, has led to a growing need for collaborative, structured approaches to decision making. Adaptive management emerged in the late 1970s and 1980s as one such approach, rooted in parallel concepts found in business and science best-management practices. In 2004, the National Research Council defined adaptive management as a process that promotes flexible decision making in the face of uncertainties, as outcomes from management actions and other events become better understood. This approach (1) emphasizes collaboration among resource managers, researchers, and stakeholders and stakeholder involvement and (2) encompasses several closely linked steps, including assessing the problem, designing a plan that includes measurable management objectives and exploring alternative ways to meet them, predicting the outcomes of alternatives and implementing one or more of them, monitoring the impacts of the selected management actions, and evaluating and using the results to adjust management actions (see fig. 4).

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**Figure 4: The Adaptive Management Process**



Source: GAO analysis of Department of the Interior information.

Although adaptive management has been widely discussed in academic literature for decades and has been called for in many resource-planning documents and cited by resource managers, it has rarely been implemented effectively in practice, according to some experts. In the early 1990s, for example, in a plan intended to defuse a bitter controversy over the need for habitat for the threatened spotted owl and the desire to log old-growth forests in the Pacific Northwest, the Forest Service attempted to shift its forest management practices toward an adaptive management paradigm, with mixed results. Still, adaptive management continues to be viewed as a potentially useful decision-making approach for engaging partners collaboratively in managing shared natural resources. As recently as 2007, for example, the Department of the Interior produced guidelines for adaptive management and developed a training program to acquaint its staff with its practice and implications.<sup>11</sup>

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<sup>11</sup>Department of the Interior, *Adaptive Management: The U.S. Department of the Interior Technical Guide* (Washington, D.C.: 2007).

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## Agencies Have Made Less Progress Than Anticipated in Implementing the Interagency Bison Management Plan

The partner federal and state agencies have made less progress in implementing the interagency bison management plan than they originally anticipated. When the agencies agreed to the plan in December 2000, they expected to progress to step two by winter 2002–2003; as of December 2007, however, they remain in step one. Specifically, the agencies have not yet met two significant conditions for moving into step two: first, that no cattle graze on the Royal Teton Ranch north of Yellowstone National Park and, second, that a safe and effective remote vaccine-delivery mechanism be available. The agencies have, however, completed a number of other tasks called for in the plan, including management actions to keep bison and cattle separate in space and time; some scientific research, such as investigating the persistence of the *Brucella abortus* bacterium in the environment; and additional measures to prevent the spread of the disease to livestock. The agencies have spent in excess of \$2 million annually on plan implementation since 2002, with the federal government funding at least 95 percent of these costs and the state agencies funding the remainder. As of December 2007, the agencies had no estimate for how long it will take to complete the conditions for moving to step two, nor do they have plans to revise their estimated dates for reaching step three.

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## Agencies Remain in Step One of a Three-Step Plan

Although the federal and state partner agencies had anticipated progressing to step two on the north and west sides of the park by winter 2002–2003, they have not yet met the following two significant conditions necessary for doing so:

- On the park’s north side, the remaining condition for moving to step two is that cattle no longer graze on the Royal Teton Ranch north of the park. A lease agreement to graze cattle on the ranch was set to expire in 2002, and when the plan was written, the partner agencies expected that no cattle would remain on the ranch after that date. In 1999, the federal government sought to acquire the ranch’s grazing rights in perpetuity to keep the land cattle-free, but negotiations between the government and ranch owners failed in early 2000 because of irreconcilable differences of opinion over the monetary value of those rights. Nevertheless, when the plan was finalized later in 2000, the requirement that no cattle graze on the ranch remained in the plan as a condition for moving to step two. Meanwhile, the ranch owners continued to graze cattle on the ranch, and negotiations over removal of these cattle did not resume until 2005, when the ranch owners agreed to discuss with Montana Fish, Wildlife and Parks a possible deal for the grazing rights. According to a Montana Fish, Wildlife and Parks official, the parties have tentatively reached

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agreement on a 30-year grazing lease that would remove cattle from the property and provide a corridor for a limited number of bison to travel across the ranch in winter to access national forest system land north of the ranch. As of December 2007, issues needing to be resolved in order for the agreement to be finalized included obtaining funding commitments from various sources for the tentatively negotiated lease price and determining which entity would be responsible for the installation and maintenance of the infrastructure, such as fencing and cattle guards, to delineate the bison corridor.

- On the park's west side, progressing to step two is contingent on meeting another key condition, the development of a safe and effective remote vaccine-delivery mechanism. The Park Service moved toward this goal in January 2004, when it established that RB51, a brucellosis vaccine originally developed for cattle, was also safe for bison calves and yearlings. Once a safe vaccine was identified, the Park Service began developing a draft environmental impact statement evaluating remote delivery alternatives for a parkwide vaccination program. For example, Park Service worked with Colorado State University researchers to develop an improved way to encapsulate the brucellosis vaccine in a special biobullet that could be remotely administered to bison using air rifles. Park Service officials expect to release their draft environmental impact statement for public comment in summer 2008.

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### Agencies Have Completed a Number of Plan Tasks

As of December 2007, the agency partners had completed a number of other tasks called for in step one of the plan. For example:

- In 2002, the agencies established interagency operating procedures outlining their respective roles and responsibilities for restricting bison to areas generally within or just beyond the park's boundaries. Outside the park, the Montana Department of Livestock has the lead responsibility for all bison management actions and may request assistance from Montana Fish, Wildlife and Parks; the Forest Service; APHIS; and the National Park Service. Inside the park, Park Service has the lead responsibility for all bison management actions. In November 2007, the agencies updated these procedures, providing greater details regarding responsibilities related to law enforcement, private property protection, and media relations, among others.
- The agencies have also conducted scientific research, such as investigating the persistence of the brucellosis-causing bacteria in the environment, to better understand transmission risks. Agency officials have determined that their findings on the amount of time the bacteria



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remained viable in the environment validated the amount of time required by the plan to separate bison and cattle grazing on the same lands. Other agency research has included extensive testing to identify a safe vaccine for bison and to evaluate the vaccine's risk to wildlife other than bison. The results of this research enabled the agencies to verify the safety of RB51 for delivery by injection to bison calves, and the agencies vaccinated a limited number of calves and yearlings (about 120) in 2004 and 2005. According to a park official, a team of Park Service researchers also annually collect a variety of bison data, including data on survival (especially the survival of females and calves), movement patterns on the landscape, and estimated population.

- Two of the partner agencies—APHIS and the Montana Department of Livestock—have implemented additional risk mitigation measures identified in the plan to prevent the spread of the disease to livestock. These measures include ensuring that all vaccination-eligible cattle (calves and yearlings) within specific bison management zones on the north and west sides of the park have been vaccinated and annually testing cattle that graze seasonally in these management zones to help monitor and prevent the spread of the disease. According to APHIS officials, all ranchers with cattle in the bison management zones are in compliance with the vaccination risk mitigation measure, and Montana Department of Livestock officials ensure that annual testing is completed on cattle that graze seasonally in these zones.

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### Partner Agencies Have Spent More Than \$2 Million Annually to Implement the Plan

Since 2002, the partner agencies have spent more than \$2 million annually implementing plan activities, including bison management actions and research (see table 1). Federal funding has exceeded 95 percent of these annual expenditures and state funding has composed the remainder (see fig. 5). National Park Service and APHIS expenditures make up most of the federal spending. APHIS provides nearly \$1 million annually to the Montana Department of Livestock for bison operations and research activities, in addition to what APHIS spends on its own operating costs.

**Table 1: Estimated Annual Bison Management Expenditures (Unadjusted for Inflation), by Agency, Federal Fiscal Years 2002–2007**

	2002	2003	2004	2005	2006	2007	Total
National Park Service	\$1,200,000	\$1,148,075	\$1,207,175	\$1,204,300	\$1,316,000	\$1,182,463	<b>\$7,258,013</b>
Forest Service	100,215	150,000	103,172	95,763	100,278	90,000	<b>639,428</b>
Animal and Plant Health Inspection Service <sup>a</sup>	916,610	925,284	1,151,667	1,156,540	1,806,067	1,570,408	<b>7,526,576</b>
Montana Department of Livestock	6,053	47,628	19,504	18,533	20,353	16,906	<b>128,977</b>
Montana Fish, Wildlife and Parks <sup>b</sup>	59,329	62,983	58,363	68,778	62,119	67,723	<b>379,295</b>
<b>Total</b>	<b>\$2,282,207</b>	<b>\$2,333,970</b>	<b>\$2,539,881</b>	<b>\$2,543,915</b>	<b>\$3,304,817</b>	<b>\$2,927,500</b>	<b>\$15,932,288</b>

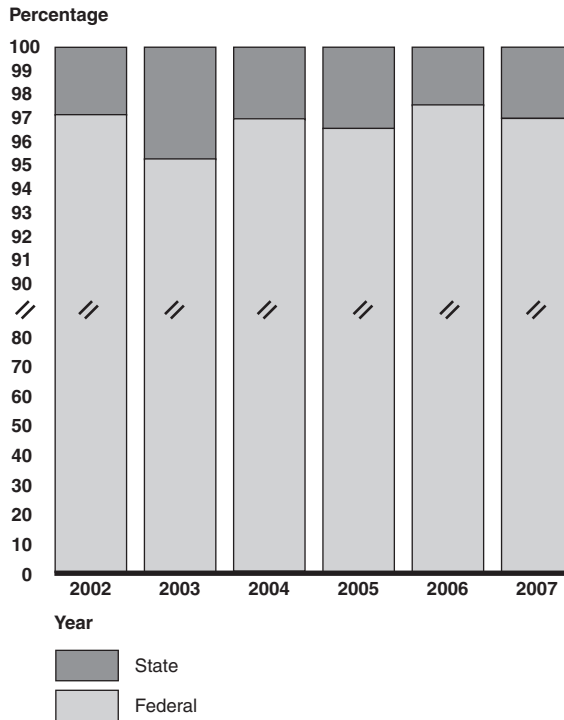
Source: GAO analysis of National Park Service; Forest Service; Animal and Plant Health Inspection Service; Montana Department of Livestock; and Montana Fish, Wildlife and Parks data.

Note: Data provided by the agencies were, in most cases, estimates of expenditures for bison management activities. Expenditures for bison management activities include personnel and equipment costs for bison hazing operations, capture facility operations and maintenance, security, public relations, interagency coordination, disease testing, vaccination, the vaccination environmental impact statement, and training. We assessed the reliability of these estimates and found them to be sufficiently reliable for the purposes of our work.

<sup>a</sup>APHIS annual expenditure totals include the agency's expenditures for operating costs as well as the funds it provides to the Montana Department of Livestock for bison operations and research activities. The Montana Department of Livestock uses these funds to pay personnel and purchase equipment used for bison management activities outside the park and to contract with Montana Fish, Wildlife and Parks to conduct research on elk, pregnant bison, and the quarantine feasibility study.

<sup>b</sup>Montana Fish, Wildlife and Parks' expenditures were provided on a state fiscal year basis, but since most of the bison management expenditures occur within the corresponding federal fiscal year, no conversion was performed.

**Figure 5: Estimated Annual Federal and State Bison Management Expenditures (Unadjusted for Inflation), Federal Fiscal Years 2002–2007**



Source: GAO analysis of National Park Service; Forest Service; Animal and Plant Health Inspection Service; Montana Department of Livestock; and Montana Fish, Wildlife and Parks data.

In addition to these annual costs, the Forest Service and the Department of the Interior also spent nearly \$13 million in the late 1990s to purchase land and a conservation easement just north of the park.<sup>12</sup> The land was acquired to protect geothermal resources; improve recreational access; and provide habitat for a variety of wildlife species, including bison. The conservation easement was purchased to prohibit development on the private land, such as the construction of commercial facilities and roads.

<sup>12</sup>GAO-07-638T.

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## Agencies Have Not Revised Plan Timeline Estimates

The agencies have no estimate for how long it will take to complete the remaining two conditions for moving to step two, nor do they have plans to revise their estimated dates for moving to step three, which they had expected to reach by winter 2005–2006. According to agency officials with whom we spoke, they have not completed the requirements in step one as quickly as they had expected, in part, they said, because the original estimates in the plan were overly optimistic. Neither have they revised their estimated timelines for reaching steps two and three because, according to a Forest Service official, such efforts would not be the best use of their time, given the number of variables beyond the agencies' control. For example, the agencies have limited control over when, or even if, cattle will no longer graze on the Royal Teton Ranch. Consequently, partner agency officials have discussed, but have no plans for, revising the estimated completion dates as stated in the plan, leaving the expected date for reaching step three uncertain.

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## Key Deficiencies in the Plan, and the Agencies' Implementation of It, Limit Their Effectiveness with Regard to Managing Bison-Related Issues

Key deficiencies in the bison management plan, and the agencies' implementation of it, limit their effectiveness with regard to managing bison-related issues. The plan lacks clearly defined, measurable objectives against which actual outcomes can be compared to guide the agencies' decision making and to measure the effectiveness of their actions. Without such objectives, the agencies lack a sound basis for selecting and monitoring their management actions, triggering adjustments to those actions, and determining the plan's effectiveness. In addition, the agencies' failure to adequately implement an adaptive management approach has limited the effectiveness of their bison management efforts. The agencies adopted an adaptive management approach in the plan so that they could continue to address uncertainties related to bison and brucellosis, while still taking actions to manage bison. But their efforts to implement an adaptive management approach have been undermined because all components of adaptive management—from collecting information about their management actions through a systematic monitoring program to adjusting their management actions—should flow from clearly defined objectives, which are absent from the plan. In addition, while adaptive management principles emphasize effectively managed partnerships and active involvement of stakeholders, the agencies have acted more as individual entities than as a cohesive interagency group, and they have not adequately communicated with or involved stakeholders. Consequently, the agencies' decision making lacks accountability and transparency, more often resembling trial and error or crisis management, rather than adaptive management.

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## The Plan Lacks Clearly Defined, Measurable Objectives

The interagency bison management plan lacks clearly defined, measurable objectives against which actual outcomes can be compared to guide the agencies' decision making and to measure the effectiveness of their actions. Objectives in adaptive management plans should specify desired measurable outcomes, be achievable given the capacities of the natural resource system being measured and the political or social system within which management occurs, and indicate the time frame for achievement. Explicit articulation of measurable objectives helps to distinguish adaptive management from trial and error, because the objectives direct and justify the exploration of specific management options over time.

The interagency bison management plan does not have clearly defined, measurable objectives, and the partner agencies share no common view of the objectives. Consequently, the agencies have no sound basis for making decisions or measuring the success of their efforts. Although the plan includes a section titled "Objectives," this section does little more than state the plan's overall goals to maintain a free-ranging bison herd and to address the risk of brucellosis transmission to protect the livestock industry. When we asked officials of the five partner agencies to refer us to the specific objectives by which they are managing, their responses varied. Some agency officials referred to the overall goals, others directed us to 14 tasks the agencies identified in a 2005 status review,<sup>13</sup> still another cited 9 objectives from the final environmental impact statement that preceded the adopted plan, and one official could not recall any objectives. Although the items they referred to were not completely distinct from one another, they were not included in the plan as objectives and lacked the specificity and metrics needed to provide a sound basis for making decisions about management actions and measuring the effectiveness of those actions. The plan specifically states that it does not identify how the agencies will measure success or failure. In fact, several agency officials acknowledged that they had not identified metrics or parameters for measuring how well they are meeting the plan's stated goals.

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<sup>13</sup>National Park Service; USDA Animal and Plant Health Inspection Service; USDA Forest Service; Montana Department of Livestock; and Montana Fish, Wildlife and Parks, *A Status Review of Adaptive Management Elements, 2000 to 2005* (September 2005). The intent of the review was to provide an assessment of how successful the bison management plan has been in achieving the goals set forth in the final environmental impact statement and records of decision issued by the state and federal agencies.

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Absent explicitly stated, clearly defined, measurable objectives, the agencies share no common view regarding how they are assessing the effectiveness of the bison management plan. For example:

- Most of the agency officials referred to the overarching dual-purpose statement—“to maintain a wild, free-ranging population of bison and address the risk of brucellosis transmission to protect the economic interests and viability of the livestock industry in Montana”—as their guide for measuring the plan’s effectiveness. Yet this statement leaves much to interpretation. For example, to describe how the partner agencies intend to “address” the risk of brucellosis transmission, the plan interchangeably uses the terms “minimize” and “reduce,” despite the different meanings of these words, and the plan does not define either of these terms. The terms also imply that there is a recognized baseline risk from which to measure, but despite a general agreement among resource managers and scientists that the risk brucellosis-infected bison pose to domestic cattle is low, but greater than zero, the agencies have not conducted a risk assessment to better quantify the risk of brucellosis transmission and establish a baseline.
- Some agency officials noted that any risk of brucellosis transmission to cattle greater than zero is unacceptable, and that a better measure for assessing the plan’s effectiveness is the extent to which the disease is becoming less prevalent. Disagreement remains, however, among professionals in wildlife science, disease, and management and in livestock disease and management on some central issues relating to brucellosis in Yellowstone bison, including brucellosis prevalence. The disagreement persists because, as agency officials noted, the method currently used to determine prevalence—a blood test indicating exposure to the bacterium, rather than the presence of the bacterium itself, which is the best diagnostic tool available at present—is a poor indicator of the actual percentage of infectious animals in the population. Long-term averages of opportunistically, rather than systematically, collected data from Yellowstone bison indicate that the fraction of bison that have been exposed to the bacterium falls between 40 and 50 percent, and limited testing of bison captured during management actions from 2001 to 2006 showed an exposure rate generally between 35 and 55 percent. Within a herd, however, the number of animals capable of transmitting the bacterium is generally fewer than the number of animals with positive blood tests. Data suggest that the percentage of infected animals—those capable of transmitting the bacterium—may be as low as 2 percent or as high as 46 percent of animals testing positive for exposure. Further complicating the agencies’ ability to determine the actual prevalence of

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the disease within the population is that, according to brucellosis experts, some animals can test negative for exposure and still be infected, while the age and sex of the animal can also influence test results. Researchers have developed a new method that specifically tests for the presence of the brucellosis bacterium rather than the antibodies to the bacterium, offering a potential new management tool.<sup>14</sup> This test, however, has not yet been validated for field use with bison.

- Still other agency officials believe the plan has been effective because under the plan, they have prevented commingling of bison and cattle, no proven transmission of brucellosis from bison to cattle has occurred, and agency cooperation has improved.

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## Agencies Have Not Adequately Implemented an Adaptive Management Approach

The partner agencies have not adequately implemented an adaptive management approach, which is the management strategy the agencies specified in the plan. In principle, adaptive management distinguishes itself from simple trial and error by its structured decision-making approach, which emphasizes accountability and transparency. Adaptive management is defined in the bison management plan as testing and validating the proposed risk management and other management actions with generally accepted scientific and management principles. Nevertheless, several agency officials told us that the agencies interpret the definition differently with respect to its operational implications under the plan. Yet while different philosophies exist about how adaptive management can be implemented, certain essential characteristics transcend them. These characteristics include (1) linkages among key steps, such as identifying clearly defined, measurable management objectives; designing and implementing a monitoring program to systematically obtain information—either operationally, scientifically, or both—about the impacts of management actions and to reduce uncertainties; and making decisions about adjustments to management actions based on what is learned; (2) collaborating with agency partners; and (3) communicating with and engaging key stakeholders.

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<sup>14</sup>According to the U.S. Geological Survey, a published study by researchers at the Idaho National Engineering and Environmental Laboratory (now known as the Idaho National Laboratory) has shown that it is possible to detect *Brucella abortus* DNA in blood samples rather than antibodies to *Brucella abortus* and thereby determine actual infection.

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Agencies' Plan Implementation Lacks Linkages among Critical Steps within Adaptive Management

The first essential component of adaptive management—linkages among management objectives, information obtained through a systematic monitoring program, and decisions regarding adjustments to the plan and their management actions—is impaired, in part, because the plan itself lacks clearly defined, measurable objectives. Additionally, the agencies have not designed a monitoring program to systematically collect data from their management actions, nor have they set forth a coordinated research agenda to resolve remaining critical uncertainties related to bison and brucellosis-related issues. A Park Service official acknowledged that the agencies have not designed or implemented an evaluation approach to validate or modify the bison management plan, as needed, but said that each agency has its own monitoring efforts, and these results are brought to the interagency partner meetings. He said, for example, that the Park Service conducts surveillance for all wildlife species and has developed a long-term bison monitoring program. The data collected on bison include population size, survival rates, and movement patterns. Another Park Service official said that officials conducting bison management operations use this information, but the agencies need a better focus on what factors to monitor and what their decision thresholds should be for management actions under the bison management plan. In contrast, according to a Montana Fish, Wildlife and Parks official, this state agency is not monitoring any specific variables related to the bison management plan. Park Service, APHIS, and Montana Department of Livestock officials also told us that they are not testing any hypotheses or the assumptions on which the plan is based. Furthermore, the agencies have no process to collectively review new scientific information related to brucellosis, much less to assess how the plan may need to be changed to reflect the latest information. A Park Service official acknowledged that within the intent of the plan, the agency partners probably need to revisit new science as part of adaptive management.

In the absence of a systematic monitoring program, the agencies have lost opportunities to collect data that could help resolve important uncertainties. The plan states that all captured bison are to be tested for exposure to brucellosis, but fewer than half of those captured since 2001 have been tested. For example, in early winter 2006, the agencies lost an opportunity to collect scientific data on about 900 bison. Park Service officials captured these bison as they attempted to leave through the park's northern boundary. The bison were consigned to slaughter without being tested at the capture facility because the Park Service determined that they would not be used for research and could not be held in the capture pens until the spring for release back into the park. The Park Service and APHIS had instead made arrangements to collect and test



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samples from the bison upon slaughter. According to APHIS officials, however, Montana's governor prohibited Montana Department of Livestock officials, who are responsible for hauling captured bison to slaughter under a federally funded cooperative agreement, from transporting the bison in this case, primarily to avoid negative press for the state. As a result, APHIS was left to arrange for hauling the bison to slaughter, and the officials who were to collect and test samples from the bison were instead reassigned to assist with the transportation efforts.

The agencies cite the following actions as examples of how they have used adaptive management, but because their decision making lacks linkages to clearly defined, measurable objectives and information gained through a systematic monitoring program or research, the actions more closely resemble trial and error than adaptive management:

- *The agencies made three formal management changes in November 2006.* In a memorandum to the administrative record, the agencies formally documented three changes to their 2006–2007 operating procedures. These changes included modifying hazing operations to allow bison to remain in certain areas outside the park, increasing tolerance for bull bison under certain conditions, and clarifying that a reference in the bison management plan to a population size of 3,000 is not a target for population adjustment, but rather a population indicator to guide implementation of risk management activities. It is not clear, however, what objectives these changes were intended to serve or how the agencies planned to assess whether the effects of these changes aligned with a desired outcome. For example, with regard to hazing, rather than push bison outside the park back into it, where they were unlikely to remain, the agencies agreed to haze the bison from areas of high transmission risk—where cattle would graze in the spring—to areas of lower transmission risk—such as public lands surrounding the park where cattle do not graze. In making this change, however, the agencies did not articulate the basis for it or what they hoped the outcome would be. In addition, the memorandum stated that the reference in the plan to a population size of 3,000 bison was a management threshold, not a population target. Yet this statement is incongruous with several statements throughout the plan and record of decision specifying that the agencies will control the population size as a brucellosis risk mitigation measure.
- *The agencies have observed effects of their management actions.* Most agency officials with whom we spoke noted that they are not testing specific hypotheses or assumptions on which the plan is based, but are instead observing the effects of their management actions and

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then making changes they believe are necessary. Yet, without desired outcomes expressed in clearly defined, measurable objectives, it is unclear how the agencies assess whether and how to change their management. For example, when revising their operating procedures for 2007–2008 in November 2007, agency officials reconsidered the hazing approach they applied in spring 2007 that was outlined in the November 2006 memorandum to the record because of the unusual number of bison—several hundred—that remained outside the park beyond the May 15 deadline. Agency officials indicated that if the extent of bison migration from the park is similar to or more severe than last year, they are prepared to haze more aggressively, hazing earlier and pushing bison deeper into the park, despite no identified transmissions of brucellosis from bison to cattle. The agencies have not issued a subsequent memorandum to the administrative record to document this change, nor do the 2007–2008 operating procedures specify the conditions that would trigger such aggressive hazing. With no connection to a clear management objective, the agencies’ decision to modify their management approach on the basis of an unprecedented situation—as the events of spring 2007 were characterized by one Park Service official—seems little more than a reaction to avert recurrence of a politically charged situation. In fact, some agency officials admitted that they generally operate in a reactive, crisis-management mode when dealing with spring bison migrations from the park.

- *The agencies have conducted research on some critical uncertainties related to bison and brucellosis.* When the agencies developed the bison management plan, several questions lacked answers, such as how long brucellosis-causing bacteria could survive in the environment, the likelihood that a pregnant female testing negative for exposure to the bacteria could shed the bacteria, and how to best diagnose the disease. Beyond identifying and conducting the following research projects in the plan, the agencies have no coordinated research agenda to address other uncertainties. APHIS and Montana Fish, Wildlife and Parks staff conducted studies during 2001 to 2003 to learn more about how long the bacteria would survive under certain environmental conditions. In 3 of the past 7 years, the agencies have also monitored 39 pregnant females that initially tested negative for exposure to brucellosis to determine if they shed the bacteria into the environment during abortion or birth. Regarding bacterial survival in the environment, the agencies used the study results to validate specifications in the plan related to the required separation in time between bison and cattle—a process that aligned with adaptive management principles. In the absence of a systematic program to

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collect information through monitoring and research for use in decision making, however, it is not clear how the agencies have used the results of monitoring pregnant females or weighed relevant science conducted by other researchers when considering changes to the plan.

**Partner Agencies Operate More as Individual Agencies Than as a Cohesive Interagency Group**

The agencies recognized in the plan that a coordinated, cooperative management effort—a second essential component of adaptive management—was necessary for plan implementation. Nevertheless, they operate more as independent entities within their respective jurisdictions and authorities. Although all of the agency officials with whom we spoke said that coordination and cooperation among the partners has improved since the plan began, and some said that they seek interagency support when making decisions within their respective jurisdictions, others said that finger-pointing has been an issue when it comes to taking responsibility; still others admitted that the agencies could be doing more to portray a shared message. For example, Montana Department of Livestock officials said that the agencies need a strategy that better communicates to the public that decisions are made and supported by all five agencies. In addition, the operating procedures specify that the Park Service is the lead decision-making agency within park boundaries, while the Montana Department of Livestock takes the lead on most issues outside the park. But the plan and the operating procedures are silent on where the responsibility lies for administrative duties of the interagency group. To date, the agencies have shared responsibility for scheduling and leading meetings. A Park Service official said, however, that it has been difficult to coordinate both technical staff and decision makers from all agencies for meetings and pointed out that bison management is an added duty for most of the staff involved. APHIS officials said the lack of a lead agency for administrative functions, such as scheduling and documenting interagency meetings, has been a challenge to more coordinated efforts and that having a single agency responsible for administrative functions would help keep the group moving forward.

**The Agencies Have Not Adequately Communicated with or Engaged Stakeholders**

A third component essential to adaptive management is communication with and involvement of key stakeholders. The agency partners generally believe that they have engaged stakeholders and provided sufficient opportunities for their involvement, but several of the stakeholders we spoke with continue to have concerns about the agencies' transparency with the public.

Agency officials said that since the plan began, they have held multiple public meetings related to bison management. Still, these meetings have generally taken place during business hours, and the discussion topics and

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decisions from these meetings have not been documented or kept in a central location convenient for public access. As a more comprehensive outreach effort, the partner agencies hosted two large-scale evening open houses—one in January 2007 and another in December 2007—to inform the public on a variety of bison management related topics. At the January 2007 meeting, the agencies solicited stakeholder views on several bison management related topics, but until early December 2007, they had not shared with the public a summary of the ideas expressed at the January meeting or an explanation of how they intended to use the information they gathered. At the second open house in early December 2007, the agencies publicly reviewed the 2006–2007 operations; provided an overview of plans for the upcoming 2007–2008 season; discussed the feedback they received during the January 2007 open house; and conducted discussion sessions about bison operations, brucellosis in Montana, and progress made to date on the plan. These efforts notwithstanding, the agencies also lack a mechanism, such as a coordinated interagency annual report, by which to document for the public their collective progress related to the plan. As a result, the agencies lack accountability among themselves and to the public, and it is difficult for the public to obtain information without attending the meetings or contacting each individual agency.

Several of the conservation groups, livestock industry groups, ranchers, and private landowners with whom we spoke expressed a common concern about the agencies' lack of transparency with the public. Some of the stakeholders with whom we spoke attended the January 2007 interagency open house and thought it provided a good forum for discussing ideas, but questioned how the stakeholders' views expressed at the meeting would be used. Similarly, one stakeholder shared his frustration over the agencies' failure to consider information he had provided relevant to potential areas for expanded bison habitat. Others cited a need for the agencies to obtain and present to the public more factual, scientific research information to eliminate uncertainties and reduce the amount of factual distortion that continues to perpetuate the controversy related to bison management. A common concern expressed among stakeholders—that the agencies were not adhering to certain plan provisions—may also indicate that agencies' communication efforts have not been clear. Specifically, several stakeholders believe that the plan specifies a population target of 3,000 bison that the agencies are failing to maintain. In fact, the record of decision states that “as an additional risk management measure, the agencies would maintain a population target for the whole herd of 3,000 bison,” and that specific measures may be undertaken to reduce the herd's size when the estimated population

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exceeds 3,000 animals. Park Service officials believe the November 2006 memorandum to the record clarified that this reference is not a target for population adjustment, but rather a population indicator to guide implementation of risk management activities; nonetheless, the difference in understanding persists.

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## Conclusions

While the interagency bison management plan put an end to litigation among the federal and state agencies and established a forum for continued negotiations and more cooperative action, the decades-long, bison-related controversies continue: bison are still hazed and slaughtered every year, and livestock owners are still concerned about the significant economic consequences if Montana's cattle industry loses its brucellosis-free status. Even if the agencies improve their management and fully implement the current plan through step three, we believe the controversies will continue, in part because critical underlying differences among agency mandates, management philosophies, and political interests have not been resolved. In addition, the plan lacks clearly defined, measurable objectives to guide the agencies' bison management actions, and the agencies are not adequately applying an adaptive management approach in implementing the plan. Moreover, the agencies' implementation of the plan has remained fragmented, because no single entity is accountable for coordinating and steering the management, research, and resolution of these bison-related issues. In addition, the agencies' management lacks the accountability and transparency expected by the public and Congress. Meanwhile, the federal government continues to spend millions of dollars on uncoordinated management and research efforts, with no means to ensure that these efforts are focused on a common outcome that could help resolve the controversies. Because the plan is not a brucellosis eradication plan, concerns about brucellosis transmission will still require the agencies to actively manage bison moving from the park into Montana, even if they fully implement all steps of the plan. Given these realities, improvements in the partner agencies' implementation of the plan, including more systematic application of an adaptive management approach, could contribute greatly to helping address the larger brucellosis issue in the Greater Yellowstone Area. Multiple recent suspected transmissions of brucellosis from elk to cattle in the area have highlighted the importance of addressing this disease in its broader wildlife and ecological context, and doing so could have significant implications for the future management of Yellowstone bison.

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## Recommendations for Executive Action

We recommend that the Secretaries of Agriculture and of the Interior direct the federal agencies to work with their state agency partners to take the following five actions:

To improve the management of Yellowstone bison in the national park and the state of Montana:

- Clearly define measurable objectives to express desired outcomes and refine, revise, or replace the plan and agency operating procedures as needed to reflect these objectives.
- Systematically apply adaptive management principles, including defining specific scientific and management questions to be answered, identifying the activities to be conducted to answer them, developing a monitoring program to assess the impacts of those activities, and incorporating the results into the bison management plan.

To enhance interagency collaboration, promote transparency, and strengthen the agencies' accountability to the American public:

- Establish a single publicly available repository, on a Web site or at a location easily accessible to the public that includes all documents reflecting decisions made and actions taken with respect to plan implementation.
- Report annually to Congress on the progress and expenditures related to the plan's measurable objectives once these have been clearly defined.
- Appoint a group comprised of a representative from each of the partner agencies or designate one of the five interagency partners (perhaps on an annual rotating basis) as a lead entity for plan oversight, coordination, and administration.

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## Agency Comments

We provided the federal departments of Agriculture and the Interior; Montana Fish, Wildlife and Parks; and the Montana Department of Livestock a draft of this report for review and comment. The Department of Agriculture, the Department of the Interior, and the Montana Department of Livestock generally agreed with our conclusions and recommendations; their written comments and our response to the Department of the Interior's comments appear in appendixes II, III, and IV, respectively. The federal departments and the state agency also provided

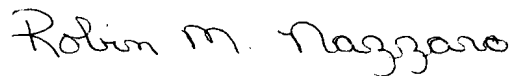
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technical comments that we incorporated into the report as appropriate. Montana Fish, Wildlife and Parks provided no comments on the report.

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As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to interested congressional committees; the Secretaries of Agriculture and the Interior; Montana Fish, Wildlife and Parks; the Montana Department of Livestock; and other interested parties. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff members have any questions regarding this report, please contact me at (202) 512-3841 or [nazzaror@gao.gov](mailto:nazzaror@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors are listed in appendix V.



Robin M. Nazzaro  
Director, Natural Resources and Environment

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# Appendix I: Objectives, Scope, and Methodology

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Our objectives were to determine (1) the progress made in implementing the interagency bison management plan and (2) the soundness of the plan and the effectiveness of the agencies' implementation of it with regard to managing bison-related issues in the Greater Yellowstone Area.

To address both of the objectives, we obtained and reviewed relevant documentation, including the bison management final environmental impact statement, record of decision, and interagency bison management plan; interagency operating procedures; and the interagency status review. We also interviewed officials from the Park Service; the Forest Service; APHIS; Montana Fish, Wildlife and Parks; and the Montana Department of Livestock. In addition, in January and February 2007, we conducted a field visit to Yellowstone National Park and surrounding areas to gain a greater understanding of bison management issues and activities performed by the agencies under the interagency bison management plan. While we were there, we visited the bison management zones identified in the plan, bison capture facilities, and various private lands on the north and west sides of the park. We also attended an interagency open house to hear public concerns related to the agencies' implementation of the bison management plan and met with representatives of the Royal Teton Ranch to understand their interests related to bison and bison management activities on and around their private lands.

To enhance our understanding about the progress the agencies have made in implementing the interagency bison management plan, we also obtained and reviewed scientific research and reports on various topics related to brucellosis and wildlife, including the safety and effectiveness of brucellosis vaccines, vaccine delivery systems, and diagnostic tests for brucellosis. In conjunction with this effort, we also interviewed researchers with the U.S. Geological Survey Northern Rocky Mountain Science Center, the APHIS National Wildlife Research Center, and the Agricultural Research Service National Animal Disease Center. In addition, we requested from the federal and state partner agencies expenditure data related to bison management activities for federal fiscal years 2000 through 2007. The agencies were able to provide complete data only for federal fiscal years 2002 through 2007, and most of these data were estimated, rather than actual, expenditures. We assessed the reliability of these estimates and found them to be sufficiently reliable for the purposes of our work. We used these data to estimate the amount of money spent annually on bison management activities and how the expenditures were shared among the federal and state agencies.



In addition to the interviews, relevant documentation, and field visits that we have previously discussed, we performed a number of other steps to determine the soundness of the interagency bison management plan and the effectiveness of the agencies' implementation of it with regard to managing bison-related issues in the Greater Yellowstone Area. We assessed the plan and the agencies' implementation of it against generally recognized best management practices, including those contained in the Government Performance and Results Act of 1993, the Comptroller General's 2004 forum on high-performing organizations, the Department of the Interior Technical Guidance on Adaptive Management, and select peer-reviewed adaptive management articles. Such practices include clearly defining measurable, results-oriented management objectives; designing and implementing a plan to monitor management actions; making decisions based on management objectives; effectively managing partnerships while maintaining accountability to Congress and the public; and actively involving key stakeholders over time to engender public support. We also conducted semistructured interviews of partner agency officials regarding their implementation and management of the interagency bison management plan, focusing specifically on their application of adaptive management principles, changes made to the plan, views on the effectiveness of the plan, interagency cooperation and coordination, and communication with and engagement of stakeholders. In addition, we conducted semistructured interviews of a judgmental sample of 30 local individuals and groups representing varied interests in bison management activities, including conservationists, livestock industry representatives, local ranchers, permittees of public livestock grazing allotments, Native American tribes, hunting enthusiasts, lessees of private land, and other private landowners. Our questions of these individuals and groups focused on the partner agencies' bison management activities and communication with and involvement of the public. We selected these individuals and groups from listings of those who provided written comments on the draft environmental impact statement, attended the interagency public meeting on January 31, 2007, or were identified to us as interested parties.

We conducted this performance audit from January 2007 through March 2008 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

# Appendix II: Comments from the Department of Agriculture



United States  
Department of  
Agriculture

Forest  
Service

Washington  
Office

1400 Independence Avenue, SW  
Washington, DC 20250

File Code: 1420  
Date: FEB 27 2008

Ms. Robin Nazzaro  
Director, Natural Resources and the Environment  
U.S. Government Accountability Office  
441 G Street, NW  
Washington, DC 20548

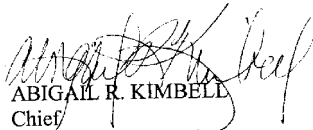
Dear Ms. Nazzaro:

Thank you for providing the United States Department of Agriculture (USDA) with the opportunity to review and comment on the draft *U.S. Government Accountability Office (GAO)* draft report entitled "Interagency Plan and Agencies' Management Need Improvement to Better Address Bison-Cattle Brucellosis Controversy." This is an extremely complex management issue and we commend you and your colleagues, Diane Lund, Jamie Meuwissen, and David Bixler, for conducting the broadest possible inquiry and working so closely with all the involved agencies and stakeholders. I am responding to the audit with the concurrence of the Animal and Plant Health Inspection Service (APHIS).

We believe that the GAO Report's Recommendations for Executive Action will improve the management of bison in the greater Yellowstone area. Specifically, the refining of the Interagency Bison Management Plan, to better define measurable objectives, will improve ongoing and future operating procedures; and that improvements can be made to enhance interagency and stakeholder collaboration and communication. The agencies have already begun to create a central repository for documentation related to the Interagency Bison Management Plan, and designate on a rotating basis a lead administrative agency among the five partner agencies. We are proposing a number of factual clarifications found in the enclosure that you should consider.

We appreciate the opportunity to review and comment on the GAO report. We are committed to using the recommendations of the GAO, and working with partner agencies and the public to continue moving bison management forward.

Sincerely,



ABIGAIL R. KIMBELL  
Chief

Enclosure



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# Appendix III: Comments from the Department of the Interior

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



THE ASSOCIATE DEPUTY SECRETARY OF THE INTERIOR  
WASHINGTON

FEB 26 2006

2006-02-26 11:46  
GNO GAO

Ms. Robin Nazzaro  
Director, Natural Resources and Environment  
Government Accountability Office  
441 G Street, NW.  
Washington, DC 20548

Dear Ms. Nazzaro:

Thank you for providing the Department of the Interior the opportunity to review and comment on the Government Accountability Office Draft Report entitled, "*Yellowstone Bison Interagency Plan and Agencies' Management Need Improvement to Better Address Bison-Cattle Brucellosis Controversy*," (GAO-08-291).

The National Park Service and the United States Geological Survey under the Department have reviewed the draft report and appreciate the report's methodical and comprehensive summary of the Interagency Bison Management Plan and progress to date by the partner agencies. This is an extremely complex issue, and we commend the auditors for their efforts to give the issue the broadest possible inquiry and work so closely with all the agencies and stakeholders involved. We support the report's overarching conclusion that refining the plan is appropriate and feasible to informing ongoing and future management.

The National Park Service believes that, in addition to the interagency coordination and management efforts to date, there is value in refining and improving the metrics of management objectives and actions as well as improving communication with stakeholders and collaboration among the partners. We are committed to incorporating these recommendations and making these improvements with the partner agencies and the public.

#### GENERAL COMMENTS

##### Brucellosis Prevalence Rates

The USGS suggests that the report would benefit from additional detail in this area. The report is correct in stating that the method currently employed reflects only exposure to *Brucella abortus*, the bacterium which causes brucellosis, and not whether the animal is capable of transmitting the disease. However the test results can be further complicated by the age and gender of the animals being sampled. Thus, any comparison between populations, or of the same population over time, should consider age and sex structure.

Additionally, a published study by researchers at the Idaho National Engineering and Environmental Laboratory has shown that it is possible to detect *Brucella* DNA in blood samples rather than antibodies to *Brucella* and thereby determine actual infection. This technique has the potential to be an important management tool by reducing the uncertainty described in the previous paragraph.

The draft report discusses areas of significant disagreement, including disagreement on brucellosis prevalence. It includes the statement, “This disagreement persists because, as agency officials’ notes, the method currently used to determine prevalence—a blood test indicating exposure to the bacterium rather than presence of the bacterium itself, which is the best diagnostic tool available at present—is a poor indicator of the actual percentage of infectious animals in the population.” The USGS agrees with this assessment of the current test and suggests that the recognition of a potential new and highly valuable management tool is an important consideration.

#### **Elk to Cattle Transmission**

The draft report references “multiple recent” transmissions of brucellosis between elk and cattle. We feel that “multiple” may suggest to readers that elk-to-cattle transmission is a frequent occurrence, while to the best of our knowledge there have been only two documented cases in the previous 5 years. The distinction in this clarification has important management implications. If indeed elk-to-cattle transmission is becoming a common occurrence, there may also be a need to begin managing elk through hazing, culling, etc., similar to current bison management. The USGS is familiar with—at most—two cases of likely elk-to-cattle transmission of *Brucella*, one in Idaho approximately 5 years ago and one in Montana during the summer of 2007. This differs from the report’s reference to events in Idaho and Wyoming.

#### **RECOMMENDATIONS FOR EXECUTIVE ACTION**

All five recommendations are directed to both the DOI and the USDA.

**RECOMMENDATION 1:** The recommendation is to work with the State agency partners to improve the management of Yellowstone bison in the national park and the state of Montana. Define measurable objectives to express desired outcomes and refine, revise, or replace the plan and agency operating procedures as needed to reflect these goals and objectives.

**Response:** We agree that clearly defined and measurable objectives, to express desired outcomes, be developed in order to refine or revise the agency operating procedures. The original operating procedures jointly developed and signed by both the Federal and State agencies in 2002, were updated and re-signed by all partner agencies in 2007 to incorporate several adaptive management adjustments to the plan. NPS does not agree with the portion of this recommendation that suggests the plan be replaced.

**RECOMMENDATION 2:** The recommendation is to work with the State agency partners to improve the management of Yellowstone bison in the national park and the state of Montana. Systematically apply adaptive management principles, including defining specific scientific and

See comment 1.

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**Appendix III: Comments from the Department  
of the Interior**

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See comment 2.

management decisions to be answered, identifying the activities to be conducted to answer them, developing a monitoring program to assess the impacts of those activities, and incorporating the results into the bison management plan.

**RESPONSE:** We agree with the recommendation to incorporate adaptive management principles (and associated specific questions, activities, and monitoring) into the plan, through adjustments to the Operating Procedures. This will be accomplished through NPS participation in the IBMP Inter-Agency Working Group.

**RECOMMENDATION 3:** The recommendation is to enhance interagency collaboration, promote transparency, and strengthen the agencies' accountability to the American public. Establish a single, publicly available repository on a Web site or at a location easily accessible to the public that includes all documents reflecting decisions made and actions taken with respect to plan implementation.

See comment 3.

**RESPONSE:** We agree with the recommendation to establish an internet Web site for open access to public documents generated through implementation of the plan. This will be accomplished through NPS participation in the IBMP Inter-Agency Working Group.

**RECOMMENDATION 4:** The recommendation is to enhance interagency collaboration, promote transparency, and strengthen the agencies' accountability to the American public. Report annually to Congress on the progress and expenditures related to the plan's measurable objectives once these have been clearly defined.

See comment 4.

**RESPONSE:** We agree with the recommendation to report annually to Congress on progress and expenditures related to the plan's measurable objectives once these have been clearly defined through the Operating Procedures. This will be accomplished through NPS participation in the IBMP Inter-Agency Working Group.

**RECOMMENDATION 5:** The recommendation is to enhance interagency collaboration, promote transparency, and strengthen the agencies' accountability to the American public. Appoint a group comprising a representative from each of the partner agencies or designate one of the five interagency partners (perhaps on an annual rotating basis) as a lead entity for plan oversight, coordination, and administration.

See comment 5.

**RESPONSE:** We disagree with that portion of the recommendation to designate one of the agency partners as the lead entity for plan oversight, coordination, and administration. The respective Federal and Montana RODs direct each partner agency to adhere to their respective agency mandates and policies. We agree with a recommendation to continue the prevailing IBMP interagency working group (established in 2002) with a designated lead agency to chair meetings comprised of representatives from the partner agencies for plan oversight, coordination, and administration.

Technical corrections are addressed separately and enclosed.

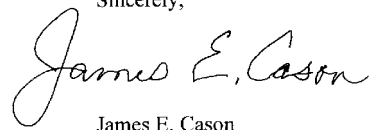
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**Appendix III: Comments from the Department  
of the Interior**

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If you have any questions, please contact Rebecca Bageant, USGS Audit Liaison Officer, at (703) 648-4328, or Ernestine Armstrong of NPS at (202) 354-1958.

Sincerely,

A handwritten signature in cursive script that reads "James E. Cason". The signature is written in black ink and is positioned above the printed name.

James E. Cason

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## GAO's Response to the Department of the Interior's Comments

Our responses to the Department of the Interior's comments are numbered below to correspond with specific passages in the department's comments (reproduced on pp. 39-42).

1. We emphasize that clearly defined, measurable objectives need to be reflected in the bison management plan. We expect that the agencies would subsequently make commensurate changes to the operating procedures to ensure that their management actions are aligned with these objectives. To the extent that the National Park Service, in cooperation with the other partner agencies, can adequately accomplish this alignment by refining or revising the existing bison management plan and agency operating procedures, replacing the plan may not be necessary.
2. We believe it is essential that the partners incorporate adaptive management principles into the bison management plan and subsequently modify the operating procedures to ensure systematic application of these principles to their management actions. In addition, we believe that this recommendation should be implemented by the entity we recommend, rather than by the IBMP Inter-Agency Working Group referenced in the department's response, as further explained in comment 5.
3. We believe that this recommendation should be implemented by the entity we recommend, rather than by the IBMP Inter-Agency Working Group referenced in the department's response, as further explained in comment 5.
4. As we noted in comment 1, we expect that the measurable objectives be clearly defined in the bison management plan and be used as benchmarks for reporting the agencies' progress to Congress. We believe that this recommendation should be implemented by the entity we recommend, rather than by the IBMP Inter-Agency Working Group referenced in the department's response, as further explained in comment 5.
5. The department states that it agrees with a recommendation to continue the prevailing IBMP Inter-Agency Working Group and notes that the department would accomplish a number of our recommendations through participation in this group. We did not recommend that the partner agencies continue the prevailing IBMP Inter-Agency Working Group to implement this or any other of our recommendations. As evident in our findings, we believe the agency partners' efforts to operate as a cohesive interagency group to oversee,

coordinate, and administer the bison management plan have been inadequate to date, which led to our recommendation that a more structured lead entity be appointed for such functions. Furthermore, none of the partner agencies, including the Park Service, had identified this group by name or referenced it as having responsibilities for these functions during the course of our review, and only the Park Service referenced it in commenting on our draft report. We envision that the responsibilities of the lead entity we have recommended would include, but would not be limited to, activities such as scheduling and documenting interagency meetings, creating and maintaining a central repository of information related to the bison management plan, and coordinating the agency partner's annual report to Congress. We do not believe that this entity will interfere with the partner agencies' ability to adhere to their respective mandates and policies.



# Appendix IV: Comments from the Montana Department of Livestock



## DEPARTMENT OF LIVESTOCK

BRIAN SCHWEITZER, GOVERNOR

PO BOX 202001

## STATE OF MONTANA

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ANIMAL HEALTH DIVISION – (406) 444-2043  
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MEAT & POULTRY INSPECTION DIVISION – (406) 444-5202  
MILK & EGG BUREAU – (406) 444-9761  
HELENA, MONTANA 59620-2001

February 8, 2008

Dear Mr. David Bixler, Assistant Director,

The Montana Department of Livestock appreciates the time and effort the Government Accountability Office has taken to study the Interagency Bison Management Plan. In the 1930s, the USDA began focusing on eradicating brucellosis from livestock, and with the State of Texas gaining Brucellosis Class-Free Status in early February 2008, this goal was finally achieved. With this monumental event, the issue of brucellosis in the GYA is likely to gain even greater attention, and we welcome the opportunity to improve the Interagency Bison Management Plan based on the GAO review.

The Montana Department of Livestock has reviewed the draft report (Government Accountability Office Report GAO-08-291) on Yellowstone bison management and we concur with the overall conclusions that the Interagency Bison Management Plan would be improved with:

- More clearly defined management objectives linked to the adaptive management framework
- Increased interagency coordination to improve interagency cohesiveness
- Improved communication with the public and affected interest groups.

The Montana Department of Livestock is committed to working with the partner agencies to incorporate these improvements into the Interagency Bison Management Plan. We have prepared specific comments to the report (attached).

We appreciate the diligent work of the staff assigned to this project.

Sincerely,

A handwritten signature in black ink that reads "Marty Zaluski".

Marty Zaluski, DVM  
State Veterinarian  
Montana Department of Livestock

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# Appendix V: GAO Contact and Staff Acknowledgments

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## GAO Contact

Robin M. Nazzaro, (202) 512-3841 or [nazzaror@gao.gov](mailto:nazzaror@gao.gov)

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## Staff Acknowledgments

In addition to the individual named above, David P. Bixler, Assistant Director; Ellen W. Chu; Richard Johnson; Diane Lund; and Jamie Meuwissen made key contributions to this report. Also contributing to the report were Elizabeth Curda, Sandy Davis, Bernice Dawson, Timothy Guinane, Carol Henn, Lynn Musser, Omari Norman, Kim Raheb, Jeremy Sebest, and Jena Sinkfield.

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# Related GAO Products

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*Yellowstone National Park: Preliminary Observations on the Implementation of the Interagency Bison Management Plan.* [GAO-07-638T](#). Washington, D.C.: March 20, 2007.

*Wildlife Management: Negotiations on a Long-Term Plan for Managing Yellowstone Bison Still Ongoing.* [GAO/RCED-00-7](#). Washington, D.C.: November 30, 1999.

*Wildlife Management: Issues Concerning the Management of Bison and Elk Herds in Yellowstone National Park.* [GAO/T-RCED-97-200](#). Washington, D.C.: July 10, 1997.

*Wildlife Management: Many Issues Unresolved in Yellowstone Bison-Cattle Brucellosis Conflict.* [GAO/RCED-93-2](#). Washington, D.C.: October 21, 1992.

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