

BEATING BRUCELLOSIS



**WYOMING
GAME & FISH
DEPARTMENT**

Conserving Wildlife –
Serving People

CONSERVATIONISTS, SCIENTISTS, AND POLITICIANS JOIN FORCES TO BEAT A DISEASE THAT INFECTS WYOMING'S ELK, BISON, AND THREATENS CATTLE.



BEATING BRUCELLOSIS

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Introduction

Managing brucellosis in elk and bison of the Greater Yellowstone Area (GYA) is one of the most complicated and contentious wildlife management issues in North America. Often called a “political disease,” brucellosis affects livestock, wildlife, and humans, resulting in social, economic, biological, and political complications that are a constant challenge for wildlife managers.

Many interest groups— state and federal wildlife and agricultural officials, hunters, ranchers, outfitters, conservationists, landowners, and the general public— have a stake in management of this disease.

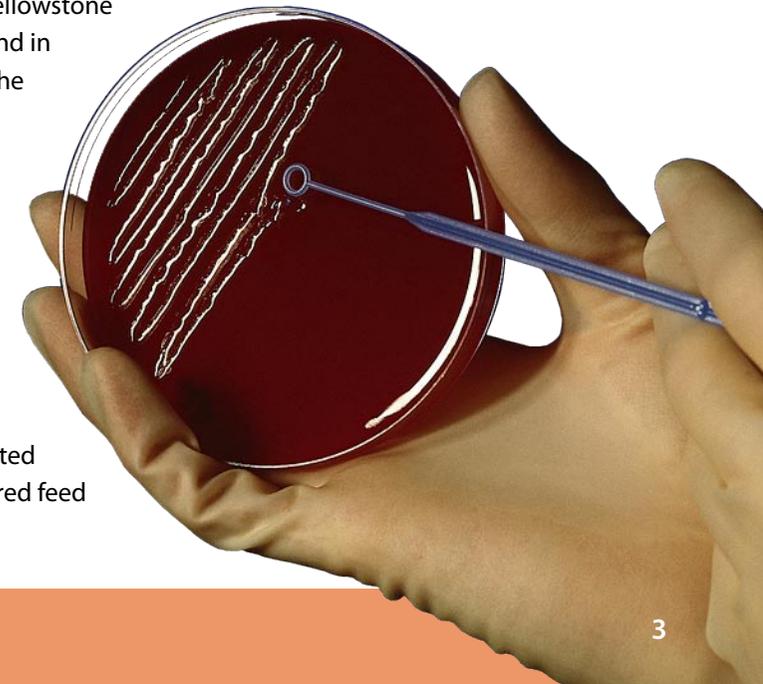
The Wyoming Game and Fish Department, along with other government agencies, private-sector organizations, and individuals, has increased its effort to solve the brucellosis problem. Together, these groups are making progress on a disease that the United States has sought to eliminate since 1934. Through vaccination, testing and slaughtering infected animals, research on new vaccines and the biology of the disease, and managing habitat to provide better forage outside the state’s feedgrounds, the disease is being managed but still remains a reoccurring encumbrance for many.

Some of the views that shape the debate over brucellosis have been with us for a century, and it is likely that eliminating brucellosis will require cooperation between all of the entities with a vested interest in the disease.

Biology of the Disease

Brucellosis is a highly contagious bacterial disease of both animals and humans that has been recognized since the nineteenth century. A cooperative state-federal brucellosis eradication program has existed for more than seventy years. This program has nearly eliminated brucellosis in domestic livestock, but the disease still exists in elk and bison in the greater Yellowstone area. Brucellosis is not found in wildlife anywhere else in the state.

Brucellosis was probably introduced into the Yellowstone area from infected bison that were transplanted into Yellowstone National Park from a brucellosis-infected cattle ranch. In addition, elk likely contracted brucellosis when they shared feed



with infected cattle in and near the park in the early 1900s.

Infection of the female reproductive tract results in abortion. A cow usually aborts her first calf following infection; a few cows will abort their second, or even third, calf. Fetuses delivered near term often are stillborn or fail to thrive due to overwhelming *Brucella* infection. The male reproductive tract (testes, seminal vesicles, prostate) can also be infected. Infection of the bone or joint membranes results in lameness that may make the animal more susceptible to predation.

The most common route of transmission is thought to be oral. Elk, bison, and most other ungulates lick newborn young, whether the youngster is alive or dead, whether it is one of their own offspring or not. They often eat placentas, fetal sacs, and even stillborn young. This instinctive reaction to a birth gives *Brucella* a perfect avenue for infecting new animals. Licking or eating an infected fetus or placenta, licking the vulva of an infected female that has just given birth, consuming any of the fluids that leave an infected female at birth— any of these is enough to transmit brucellosis to another animal.

Under cool, moist conditions, *Brucella* bacteria can survive for more than 100 days in the environment. An elk or bison that consumes feed or water contaminated by vaginal discharges or fetal membranes may develop brucellosis. Treatment of the disease in wild animals is difficult because it requires multiple drugs administered daily for several weeks.

The Game and Fish Department tests elk for brucellosis at many of its feedgrounds in northwest Wyoming. It also gathers blood samples from elk that are thought not to winter regularly on feedgrounds—



these samples are taken from elk killed by hunters.

Blood testing shows the proportion of animals that have been exposed to brucellosis and developed antibodies— veterinarians call this proportion “seroprevalence.” This testing doesn’t necessarily mean that the animal can transmit the disease. Another test is used to culture the bacteria from tissue samples— a positive case or “culture positive” indicates that the animal actually harbors the bacteria and may be able to transmit to other animals. These tests can only be done postmortem.



Governor’s Brucellosis Coordination Team

In 2004, cattle in a herd south of Pinedale developed brucellosis. Investigation strongly suggested that the cattle had contracted the disease from elk on the nearby Muddy Creek feedground. Subsequent testing also found positive herds in Teton County. As a result, the U.S. Department of Agriculture revoked Wyoming’s classification as a brucellosis-free state— the change meant that many of the cattle leaving the state had to be tested and certified as brucellosis-free. In response to these developments, Wyoming Governor Dave Freudenthal formed the Wyoming State Brucellosis Coordination Team, which presented twenty-eight recommendations to the governor and Wyoming state legislature. Major goals in the report include re-establishing class-free brucellosis status for the state; developing a plan that can be followed if another case of brucellosis is reported in cattle; addressing human health concerns; educating the public about brucellosis-related issues; and reducing and eventually eliminating brucellosis in wildlife.

Wyoming regained its brucellosis “class-free” status in September 2006 thanks in large part to the work of the Brucellosis Coordination Team. The Game and Fish Department will continue surveillance in wildlife, research, and cooperation in the management of this disease to continue to maintain the state’s status. This reinstatement has eased some of the restrictions statewide for the cattle industry, however within the brucellosis “endemic” area of northwest Wyoming, cattle producers are still required to remain vigilant.

Feedground Debate

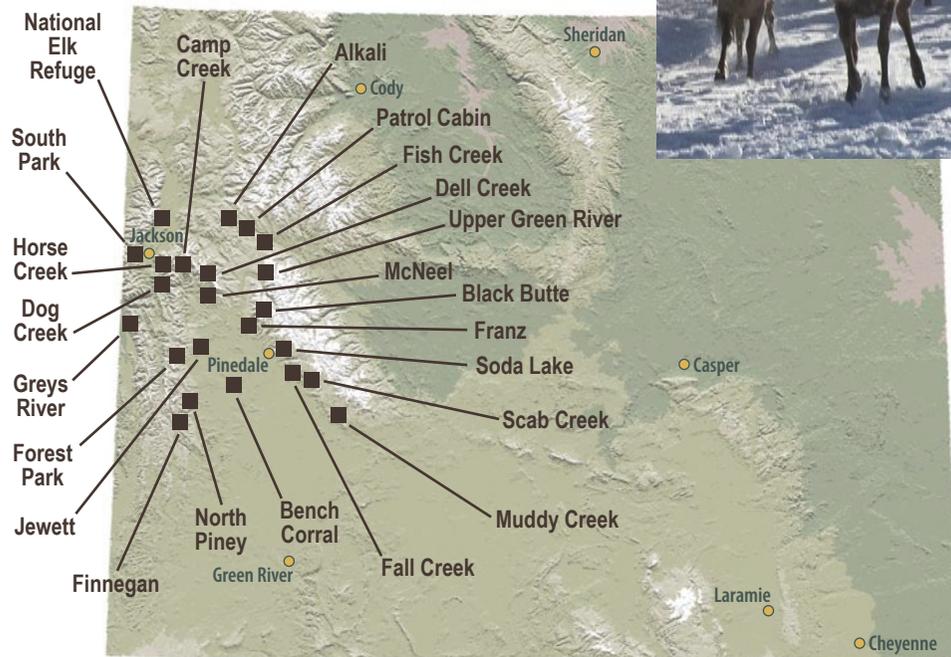
Winter elk feedgrounds in northwest Wyoming have been at the center of the brucellosis controversy. The Game and Fish Department operates twenty-two feedgrounds in northwest Wyoming, and the U.S. Fish and Wildlife Service operates a supplemental feeding program on the National Elk Refuge near Jackson. In an average year, around 13,000 elk are fed on state feedgrounds, and 6,000 are fed on the National Elk Refuge.

Winter-feeding of elk has been a part of Wyoming's culture for almost a century. Wyoming's first elk feedground was established on the National Elk Refuge in 1912 to compensate for the loss of historic elk winter habitat in the Jackson Hole area, to help prevent elk from starving during winter months, and to keep elk out of hay stored on the valley's ranches.

Since then, development has altered much of the traditional elk winter habitat in Jackson Hole and other areas of northwest Wyoming and created "bottlenecks" that prevent elk from migrating to traditional winter ranges. Today, because of the limited amount of natural

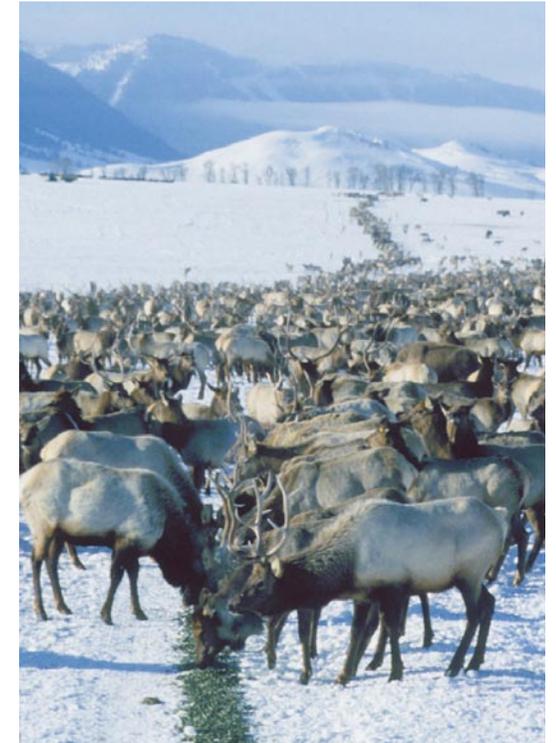


WYOMING'S ELK FEEDGROUNDS



habitat available, many of these elk have nowhere to go to find food in the winter except feedgrounds or livestock feed lines. In most situations, the only realistic alternative to feeding elk in the winter is a drastic reduction in the number of elk.

Though these feedgrounds were established as a solution to the problems of habitat loss and conflicts with private landowners, they have exacerbated other problems, most notably disease and public expectations in wildlife numbers. When animals are crowded together, as they are during most feedground operations, they often have higher rates of disease. Closing feedgrounds could reduce the prevalence of brucellosis among elk, but it would also create additional problems. Without feedgrounds, many elk would wander onto nearby private lands in search of food, where they would come into contact with livestock. One of the main benefits of feedgrounds today is that they help keep elk away from private ranches, where they could transmit brucellosis to cattle. Once elk find accessible stores of hay, they can eat large amounts of forage. The Wyoming Game and Fish Department is also required to compensate ranchers for the loss of hay, a key reason for the development of state-run feedgrounds.



Stable populations of elk have both an economic and recreational value in western Wyoming. Feedgrounds stabilize herds in this region and minimize the impact that winter and calf losses due to brucellosis have on the overall population.

The Governor's Brucellosis Coordination Team recommended several actions to help solve problems related to feedgrounds and disease. The team considered proposals to phase out some existing feedgrounds and ultimately recommended against any immediate closures. Instead, they directed the Game and Fish Department to take a comprehensive look at all brucellosis-related issues in northwestern Wyoming, including feedgrounds, and create "brucellosis management action plans" for each of the elk herds in the area.



Brucellosis Management Action Plans

The Governor's Brucellosis Coordination Team recommended the development of brucellosis management action plans for the seven-feedground elk herd units and two bison herd units in northwestern Wyoming. The plans, completed in 2008, provide guidelines for management of elk and bison that will reduce rates of brucellosis infection and the risk of transmission to livestock.

Each plan considers a variety of ways to avoid mixing livestock and elk during the winter and to reduce the prevalence of the disease. These include relocating or closing feedgrounds, reducing numbers of elk, changing the way cattle producers operate, installing fences, testing elk for brucellosis and removing infected animals, continuing vaccination programs, enhancing elk habitat, and buying winter range or conservation easements on winter range.

Test-and-Removal Project

One of the more controversial recommendations from the governor's brucellosis coordination team was an experimental five-year test-and-removal study on the feedgrounds of the Pinedale elk herd. As part of this experiment, cow elk are being tested for brucellosis, and any animals that test positive are removed and killed—the meat is then donated to food banks across the state. A similar test-and-removal approach was used to eliminate brucellosis in domestic livestock and a current program is occurring in Yellowstone bison.

Wildlife managers hope to determine whether this approach will reduce the prevalence of the disease in the Pinedale elk herd, and at the same time they expect to find

out more about the biology of the disease as it affects elk. Tissue samples from slaughtered elk are providing researchers the opportunity to develop better field tests to determine the relationship between elk that test seropositive (indications of brucellosis infection in the blood) and culture positive (confirmed brucellosis infection in other tissues).

The experiment will be evaluated by monitoring change in prevalence of brucellosis on the feedground over 5 years. The scientific community will also critically review the experiment.

Brucellosis in Cattle of Teton and Sublette Counties

When Wyoming lost its brucellosis-class-free status in 2004, it was a devastating blow to the state's livestock industry. Though the infections occurred only in western Wyoming, the entire state was affected. Costly testing restrictions were imposed on all cattle before being exported from the state. In some cases cattle weren't marketable because of a fear within other states of transmission to their herds. Additionally, there is a reduction of calf crops due to abortion "storms" that may occur within infected herds and potentially the loss of an entire herd and its bloodline if quarantined and slaughtered.

There is hope for cattle producers. The development of a more effective vaccine with a longer efficacy may prevent brucellosis transmission to cattle in the future. Also, each livestock producer in the affected region is being encouraged to develop a plan for managing his herd in cooperation with the Wyoming Livestock Board, State Veterinary Laboratory, and the Animal and Plant Health Inspection Service (APHIS). These plans are intended to minimize the possibility of brucellosis transmission from wildlife to livestock.



Brucellosis Feedground Habitat Program

The Wyoming Game and Fish Department's Brucellosis-Feedground-Habitat (BFH) program is managing brucellosis in northwest Wyoming. BFH biologists document brucellosis rates on feedgrounds by trapping elk and collecting blood samples to be tested for brucellosis. They are also responsible for the Strain 19 vaccine program at nineteen state feedgrounds and the National Elk Refuge. The last facet of the program—habitat—benefits all wildlife species in the region. Currently, elk managers

believe that habitat improvement near feedgrounds reduces transmission of the disease by spreading elk spatially or decreasing the length of time that the elk spend in close proximity on the feedground. Managers typically use prescribed fire or mechanical treatments to stimulate the growth of more nutritious forage in these projects. Over the last decade this group, in cooperation with the Game and Fish Department habitat biologists, has been instrumental in completing several habitat improvement projects near feedgrounds in the Jackson/Pinedale region, and many more are planned for the future.

The Game and Fish Department continues to pursue research projects and stay abreast of current efforts taking place throughout the Greater Yellowstone Area. This research is mostly conducted through the BFH program

and Wyoming State Veterinary Laboratory, with the cooperation of other agencies and academic institutions. These efforts have led to adaptive management of brucellosis.

One such project began on the Franz feedground in the Big Piney elk herd unit. Researchers studied potential transmission of brucellosis from fetuses to elk congregated on feedgrounds. Fetuses that tested negative for brucellosis were removed from elk on the Greys River feedground and placed strategically on the Franz feedground to find out how elk contacted them and how quickly scavengers removed them. This research led to a best management practice to eliminate scavenger hazing and control on and adjacent to state feedgrounds.

In addition, a new research effort began last January to examine the ways habitat may influence brucellosis seroprevalence and transmission. This project is a cooperative effort involving the Game and Fish Department, University of Wyoming, and Iowa State University. Researchers captured cow elk at each of three state feedgrounds and

elk that spend the winter on native winter range in the Buffalo River Valley. The three feedgrounds (Scab Creek, Soda Lake, and Bench Corral) have varying degrees of habitat improvement in their vicinity. Each cow was tested for brucellosis, given a radio transmitter, and released. The transmitters allow researchers to locate each cow as she aborts or calves. These locations will help biologists find out whether improved habitat around the feedgrounds is dispersing cows before they give birth, thereby reducing the chances of spreading brucellosis.

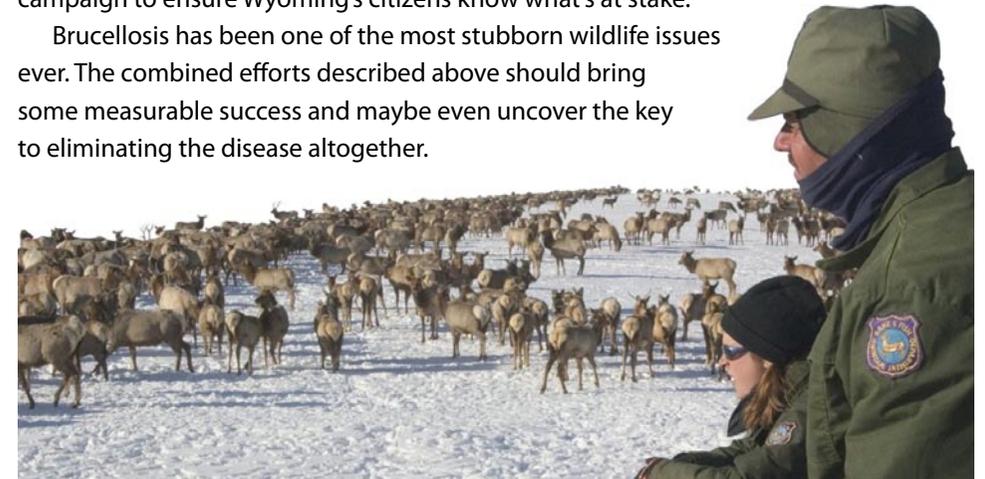
Through research such as this, the Game and Fish Department has identified feedgrounds where significant long-term reductions in brucellosis seroprevalence might be achieved by implementing management practices based on feeding and disease data from elk feedgrounds.

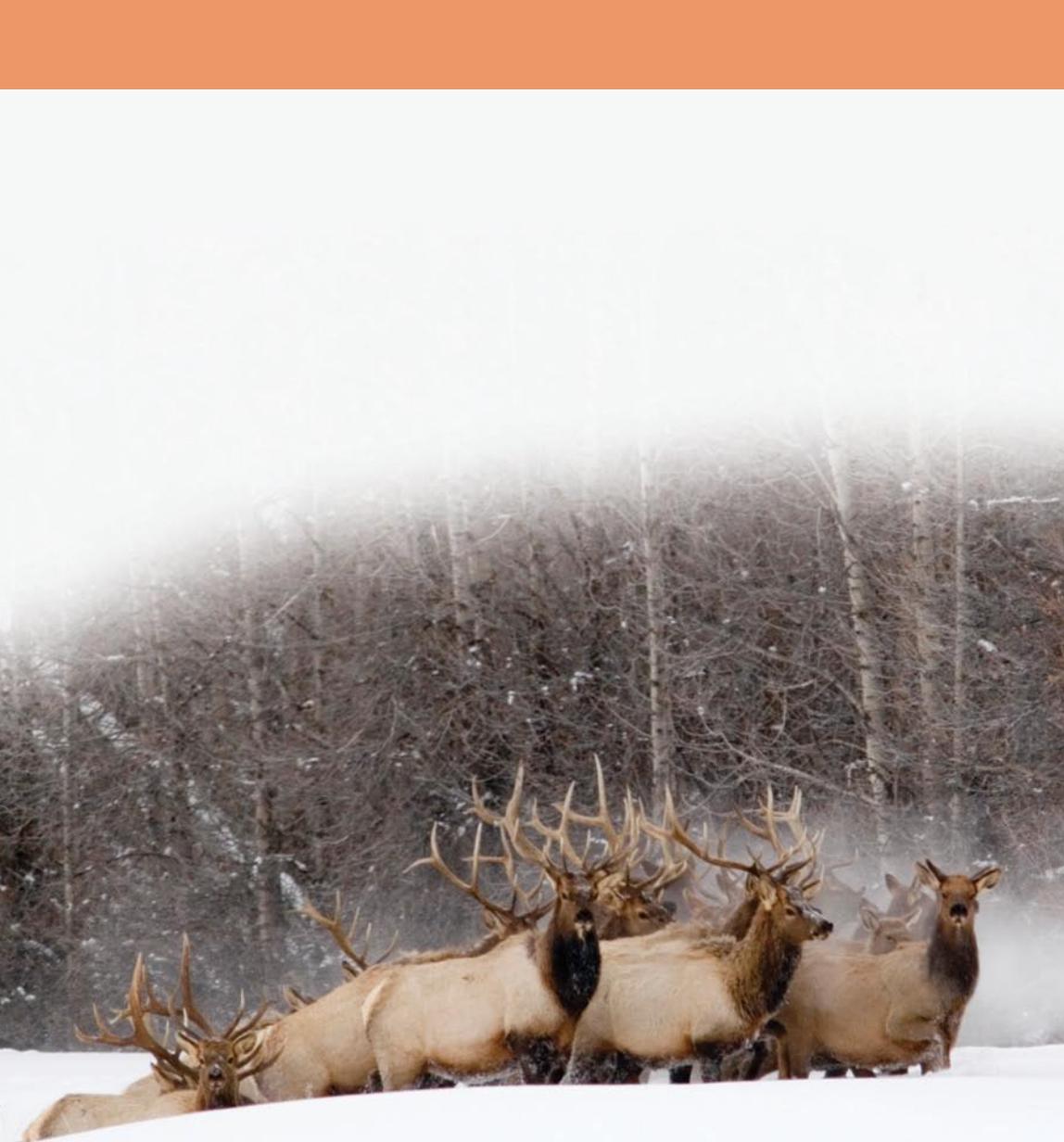
The Future of Brucellosis

Through the work of the Governor's Brucellosis Coordination Team, and through the cooperative efforts of many agencies, individuals, and organizations, more is being done now to address brucellosis in Wyoming than ever before. Brucellosis has been present in Wyoming for more than a century, and it's clear that there is no magic bullet to beat brucellosis in Wyoming. Any solutions to the complex issues surrounding this disease will require a multi-faceted, cooperative approach.

Currently, research is being conducted on new vaccines, while ranchers and wildlife managers are implementing practices to reduce commingling among elk and cattle. At the same time, biologists are learning more about how the disease is transmitted, and managers are implementing procedures to reduce transmission among elk. Habitat projects are being planned and implemented while new sources of funding for habitat treatments, conservation easements, and other efforts are being pursued. A number of agencies are also cooperating on a comprehensive public education campaign to ensure Wyoming's citizens know what's at stake.

Brucellosis has been one of the most stubborn wildlife issues ever. The combined efforts described above should bring some measurable success and maybe even uncover the key to eliminating the disease altogether.





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