



SPREAD THEM OUT:

The Issue of Brucellosis & Feedgrounds

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The establishment of feedgrounds for elk at the turn of the 20th century in Wyoming solved one problem but exacerbated another: brucellosis in elk, bison, and now cattle.

The years 1908, 1910, and 1911 were hard on Wyoming's elk. They died in the thousands, to the distress of ranchers and residents in the northwestern part of the state. The deaths were due to a combination of harsh winters, a loss of migration routes, and disappearing winter habitat. Jackson Hole homesteader Stephen Leek recorded the event in a series of painful photographs. The proposed solution was to feed elk in winter. The initial purpose was to provide supplemental food to substitute for lost habitat. The result was the National Elk Refuge and, eventually, 22 Wyoming Game and Fish Department (WGFD) feedgrounds.

The grounds became controversial when animals fed in concentrated areas in the winter were diagnosed with a high incidence of brucellosis, an important cause of infectious abortion in

cattle and elk. By contrast, free-ranging elk elsewhere were essentially free of infection. In late 2003, the transmission of brucellosis from elk to cattle near a WGFD feedground resulted in the slaughter of a large cattle herd. Wyoming lost its brucellosis-free status, costing the state millions of dollars.

In 2004, Governor Dave Freudenthal charged a representative group of citizens (called the Wyoming Brucellosis Coordination Team) with developing achievable recommendations by early 2005 for reducing and eradicating brucellosis in the state's elk. The group included wildlife experts, state and federal officials, veterinary diagnosticians, ranchers, sportsmen, and conservationists. Frank Galey, dean of the College of Agriculture, chaired the efforts with technical assistance from University of Wyo-





Starving elk are shown near a haystack in Jackson Hole in 1911. The elk in the foreground are dead. This and the accompanying photographs were taken by Stephen Nelson Leek (1858–1943), a Canadian who homesteaded in Jackson Hole. His photographs and writings were instrumental in establishing the National Elk Refuge, which was founded to end such scenes.



The human impulse to prevent starvation in elk led to the establishment of winter elk feedgrounds. However, the feedgrounds have crowded stressed wildlife and predisposed them to infectious disease. Artificial feeding does not substitute for habitat.

ming faculty members. The work of the team was an interesting, difficult, and occasionally contentious process.

For many members it came down to a choice: Should the state keep its feedgrounds or try to phase them out? If the team decided to eliminate the feedgrounds, how could it be done so that elk didn't die in large numbers during hard winters? Also, could the risk of transmitting brucellosis to cattle as elk dispersed be kept to a minimum? A decision to close the feedgrounds would entail the reduction of elk numbers in the northwestern part of the state. This would be difficult to explain and justify to sportsmen and conservationists who contributed to elk management for de-

ades. In spite of divergent interests represented on the team, there was consensus that state and federal feedgrounds have dis-

tinctly positive and negative aspects.

Brucellosis in elk is a man-made problem. It is created by the unnatural crowding of elk at



Associate Professor Don Montgomery, a pathologist with the Department of Veterinary Sciences at the University of Wyoming, performs necropsies on cattle with brucellosis. Facial protection is necessary due to the ease with which *Brucella abortus* infects people and causes human brucellosis (undulant fever). Human brucellosis is one reason why 70 years of effort and billions of dollars were invested in eradicating the disease in the United States. Wyoming and Texas remain the only "infected" states in the nation. (Photo by Vicki Hamende)

precisely the time when the disease is transmitted – late winter and spring, when elk are carrying calves and can abort. The team determined that it is paramount that the progressive loss of winter habitat and its impacts on elk be considered and reversed. The decline in habitat has accelerated due to recent rapid development in Sublette and Teton counties. If elk feedgrounds are to be maintained, the team noted, the state may be confronted with more complicated, intractable diseases down the road. Purchasing or otherwise securing additional winter habitat for elk in counties where feedgrounds can be eliminated, team members concluded, will benefit wildlife and the Wyoming livestock industry.



A necropsy is performed on the carcass of a starved elk in 1911. Stephen Nelson Leek, the man with the moustache and cowboy hat on the right side of the picture, fellow ranchers, and other wildlife advocates were alarmed at the winterkill of elk in Jackson Hole from 1909 to 1911.



An unidentified man touches a starved elk in the winter of 1911.

Why Does Brucellosis Occur in Elk on Feedgrounds?

Domestic cattle harbored the disease as far back as the late 1800s, and it was first confirmed by culture in the United States in 1910. Cattle probably infected elk and bison during the early days of the cattle industry in Wyoming. The first report of the disease in bison came in 1918.

Brucellosis in cattle, elk, and bison is due to a small, highly infectious bacterium called *Brucella abortus*. As animals abort, numerous organisms are discharged into the environment in placental fluids. The disease is of national and international importance because of the economic impact that abortion outbreaks have on cattle operations. This impact is captured in the simple

name the disease once had: infectious abortion. Ranchers with infected cattle are under pressure from state and federal agencies to depopulate their herds. The alternative is quarantine, loss of commercial reputation, and a long series of blood tests. Most ranchers send their adult female cattle to slaughter.

The artificial feeding of elk creates a dilemma for wildlife managers who wish to maintain healthy populations and an economic threat to ranchers who must keep their cattle free of the disease or run the risk of going out of business. While technical solutions such as vaccination and the physical separation of elk and bison from cattle have been pursued, a major ingredient for control-

ling the disease is to protect winter habitat so that elk can be dispersed.

Thanks to a 70-year effort at a cost of \$3.5 billion, brucellosis in cattle is now *almost* eradicated in the United States. Almost, but not quite. A large endemic focus of brucellosis persists in the Greater Yellowstone Area. A group of scientists who evaluated brucellosis in that location in 1998 on behalf of the National Academy of Sciences concluded that brucellosis is unlikely to be maintained in elk once feedgrounds are closed and elk dispersed across the landscape. A vaccine has been used by WGFD to battle the infection in elk, but its effectiveness is limited. There is little immediate prospect of a better vaccine.

A contentious issue is whether *Brucella*-infected wildlife transmit the disease to cattle. In January of 2004 a strain of *B. abortus* was isolated from cattle at the Wyoming State Veterinary Laboratory by personnel from the UW Department of Veterinary Sciences, WGFD, and the U.S. Department of Agriculture (USDA). The DNA was essentially identical to that of elk on a nearby WGFD feedground. There is no longer any question that, on occasion, elk infect cattle with *B. abortus*.

Brucellosis in Wyoming's Wildlife

When USDA began the national brucellosis eradication program in 1934, the importance of the disease in wildlife was modest because the disease in cattle was





The microscopic appearance of *B. abortus* in placental tissue is illustrated. The organism is stained red. Most organisms are inside cells, which is one reason it is difficult to develop a highly successful vaccine for wildlife such as elk.

common, and the role that wildlife played in sustaining it was small. Five years later the Wyoming Legislature put in place a big-game damage law because of the concentration of elk on private ranch lands. That prompted WGFD to experiment with the winter feeding of elk. Eventually multiple state elk feedgrounds were established in northwestern

Wyoming. They were geographically situated to gather elk and short-stop them from entering private lands and damaging hay crops. Problems with the program have been acknowledged. Feeding is expensive at \$1.3 million annually. It implies that feedgrounds can substitute for winter range and that habitat does not matter. By causing crowding, they make elk more susceptible to disease.

No cases of brucellosis were detected in Wyoming cattle between 1989 and 2003. This was due to the efforts of WGFD to keep elk and cattle separate, to the vaccination of cattle by producers, and to a big element of luck. In 2003 that luck ran out. A herd of cattle in Sublette County became

infected. A total of 37 animals tested positive for the disease. The subsequent culling and testing of elk on the adjacent feedground established that the cattle and elk had a closely related strain of *B. abortus*. Since then, two other infected cattle herds were identified in Teton County.

Wyoming lost its brucellosis-free status in February of 2004. It is unlikely to regain it until 2006 at the earliest. As a result of this loss, the state veterinarian and the Wyoming Livestock Board mandated the increased testing of female cattle throughout the state. Wyoming's reputation as a source of healthy, disease-free cattle took a hit. The costs remain to be quantified but are probably in the range of \$5 to \$10 million. From the standpoint of the cattle industry in other states, Wyoming has brucellosis in its wildlife that spills over into cattle. It may be risky to buy Wyoming cattle. This directly threatens the marketability of the animals.

At the heart of the issue is whether state feedgrounds should be continued or gradually decommissioned. Almost

all specialists agree that closure of the feedgrounds and the dispersal of elk will lead to the eventual elimination of brucellosis in elk. The disease does not appear to sustain itself in dispersed, non-feedground populations. However, the short-term impacts may be high. Closing the grounds would cause an appreciable drop in elk numbers in northwestern Wyoming. Elk-hunting income would likely no longer generate \$42 million annually in the state. A decline in elk numbers would have substantial effects on communities depending on tourism and hunting in western Wyoming. Ranchers are understandably nervous about infected elk spread over a wide geographical area that might cause more, not fewer, infected cattle herds.

The brucellosis coordination team determined that a comprehensive closure approach was not practical at this time. Whether to close individual feedgrounds on a case-by-case basis and under monitored parameters remains on the table. WGFD will use feedground closure as a management tool if and when the opportunity



arises. That opportunity translates to adequate available winter habitat. The department will continue to vaccinate elk, while recognizing the limited effectiveness of doing so. The team has recommended to the governor that the legislature provide WGFD with an adequate elk brucellosis-control budget. A realistic line-item budget for the department would allow it to run a comprehensive program to try to keep elk and cattle separate.

Another recommendation of the team is that a five-year pilot project be initiated by WGFD to evaluate a test and slaughter program, possibly leading to the closure of specific feedgrounds. The project would focus on young female elk that are most likely to transmit disease. This is a new approach. No one knows whether the sustained culling of infected elk would eliminate the disease.

Loss of Winter Habitat in Wyoming

For casual visitors, the state appears to have no shortage of open space for elk and other big game. The impres-

sion belies a major and growing problem: Wyoming's winter habitat is under pressure from human population growth in precisely those areas where habitat is needed most for the state's western elk herds – Sublette and Teton counties.

Between 1990 and 2000, the two counties saw the first and second highest human population increases in Wyoming at 63.3 percent and 22.2 percent, respectively. Much of this growth has occurred in rural areas. Many of these newcomers are buying second homes, which comprise 20.7 percent and 26.2 percent of all housing units in the two counties. While development is welcome, it erodes the amount of open space available for wildlife if it is not managed correctly. There has been an increase in the number of homeowners reluctant to allow hunting on their properties, which adds a challenging dimension to controlling wildlife numbers. Not all residents understand that hunting is one of the major tools available to WGFD to manage wildlife.

Intensive gas and oil development in the 200,000-acre Pinedale Anticline and the 30,000-acre Jonah Field is narrowing and closing off migration routes for big game. The Upper Green River Valley is one of the three most threatened big game migration corridors in Wyoming.

Investing in winter habitat for elk and improving what currently exists is critical if artificial feeding is to be reduced and eliminated. A major program in Sublette and Teton counties to secure various types of conservation easements, land swaps, and habitat improvement projects will go a long way toward maintaining open spaces, protecting viable agricultural operations, and providing winter habitat. It could be done by the state through the Wyoming Wildlife and Natural Resource Funding Act and by private organizations such as the Rocky Mountain Elk Foundation, the Wyoming Stock Growers Agricultural Land Trust, and other non-profits such as The Nature Conservancy.

Social acceptance of managing brucellosis by slaughtering infected young elk cows will be difficult to achieve. Yet maintaining the status quo is intolerable for livestock producers and wildlife managers. The historic image of thousands of starved, dying, and dead elk in the early 1900s is a prudent reminder of the centrality of adequate winter habitat for wildlife. What was then a humane effort to help starving elk is now a burden to the WGFD and the Wyoming cattle industry. Investing in habitat is a disease-management tool as important as vaccines and hunting.

Perhaps it's time to put it into play. *mm*

