

No magic bullet for wasting disease

■ Critics assail slaughter of elk, deer as strategy against CWD

By Lolly Merrell

Shirley Parrish was hiking along the outskirts of Livermore, Colo., the small town where she lives, when she stumbled on an arresting scene. "There were three or four huge pits, about 30 or 40 feet across," she says, "and there were at least 75 dead elk piled in them, burning." Similar stories from neighbors confirmed the same scene: billowing smoke spiraling from the forest, huge pits of animal carcasses on fire, and, in one report, a low-flying helicopter with gun-wielding men leaning out of the chopper's open door.

"It was terrible," Parrish says, "and the smell was just awful."

In recent weeks, Livermore has become one of nine sites used by the Colorado Department of Agriculture to dispose of the farm-raised captive deer and elk it has slaughtered in an attempt to rid the state of chronic wasting disease. Livermore is also the epicenter of CWD infection among wild deer, whose numbers are controlled by the Colorado Division of Wildlife. Twenty percent of the slaughtered animals have tested positive for the disease since testing by the Department of Wildlife began two years ago — a disturbing anomaly compared to the average infection rate of 5 percent in Colorado. Both the presence of CWD and the culling employed to control it

may have a devastating impact on the state's lucrative hunting and wildlife-tourism industry.

According to Division of Wildlife spokesman Todd Malmsbury, these numbers don't matter. "We look for the mere presence of the disease," he says, "and only one positive animal makes a ranch or location positive." So far, "positive" areas in North America include Colorado, Wyoming, Wisconsin, Kansas, Nebraska, Montana, Oklahoma, South Dakota and Canada. But for the moment, only Colorado, Canada, and most recently, Wisconsin, have adopted an aggressive eradication strategy that could eliminate nearly 1 million animals over the next several years.

So far, killing the animals has emerged as the only strategy to eradicate the spread of CWD, which is related to transmissible spongiform encephalopathy (TSE). Other TSE diseases include sheep scrapie, Mad Cow Disease (or BSE), and variant Creutzfeldt-Jakob Disease (vCJD), which has killed more than 135 people in Europe who consumed beef products from cows infected with BSE.

As the killing continues in Colorado, and as Wisconsin kicks off the country's most extreme project, with plans to reduce its 700,000 deer population by 50 percent, many scientists, politicians and disheartened observers have questions: Is this slaughter necessary, and will it actually work?

The prions among us

The answers to these questions lie



WASTED: Deer and elk can carry the CWD prion for 2 1/2 years before showing signs of the disease (Colorado Division of Wildlife photo)

within the suspected cause of CWD and other TSE diseases: an abnormal, degenerative protein called a prion. While related diseases such as scrapie in sheep and kuru in humans, have been recognized for more than a century, the prion mechanism was only identified in the late 1980s by Dr. Stanley Prusiner, who won a Nobel Prize for outlining the infectious protein's unsettling characteristics.

The prion, he discovered, transforms healthy brain protein into a misfolded mutation that ultimately leads to a deterioration of the brain. An elk or deer infected with the protein can carry the prion for up to 30 months before showing clinical signs of the disease, which include excessive slobbering, emaciation and extreme weakness.

In the past, these symptoms were the only impetus for killing an animal.

But now, the notion that any member of a sick animal's herd could be carrying the disease without showing any definitive signs, is driving the effort to cull large numbers of animals who may have been exposed to a CWD herd or their territory.

The culling strategy is supported by an epidemiological computer model created by Dr. Mike Miller, a staff veterinarian for the Colorado Division of Wildlife and one of the leaders of government-sponsored scientific research of CWD. Although there is still very little data to confirm the theoretical routes of transmission and rate of infection that helped shape Miller's model, he believes that "unmanaged outbreaks will likely devastate infected herds over a period of several decades." Miller recommends that all infected states adopt the aggressive approach of Colorado and Wisconsin.

But not everyone agrees.

The other side of the corral

"When (state officials carry out) a really massive kill, where 98 or 99 percent of the elk or deer are healthy, we're killing the stock that can lead us up and out of the infection," says Dr. Charles Southwick, a Professor Emeritus of Biology at the University of Colorado. Drawing from his decades-long research on deer living along the Front Range near Boulder, Southwick says that genetic resistance to the protein mutation has allowed the animals to live with the disease for possibly 75 years.

"We all want to control this thing," he adds, but with the current approach, "you're going to be culling deer in perpetuity" because no animal disease like chronic wasting disease has ever been completely eradicated.

Some of the most progressive research on chronic wasting disease and other TSE diseases may soon provide evidence to support Southwick's theories. Dr. Katherine O'Rourke, a microbiologist working with the U.S. Department of Agriculture, is studying the genetic susceptibility of deer and



BOTTOMLESS PIT? A backhoe scoops dead elk into piles for burning near Livermore, Colorado, as part of a state effort to stop the spread of chronic wasting disease (Diane Morrison photo)

elk to the CWD prion. After determining that prions affect one of three gene combinations found in elk ("It's like your blood type," she explains), O'Rourke has been tracking which combinations are most likely to contract CWD.

So far, one combination stands out as particularly resistant to the prion, but more testing needs to be done.

Since most existing research has been conducted on corralled animals, O'Rourke emphasizes the need to track how genetic resistance might play out in free-roaming animals. "After all," she adds, "the real life experiment is best."

And in real life, the prion appears quite able to survive. Unlike relatively fragile viruses and bacteria, the TSE prion can only be destroyed in acid or by temperatures above 1,112 degrees Fahrenheit. Some research indicates that the prion is present in saliva, urine, feces and blood.

"They're either breathing it out, drooling it out, peeing it out, or pooping it out," says O'Rourke. "And if it stays in the ground, then it can affect the other animals. You won't get very far in eradication if that's the case."

Colorado has become the laboratory, of sorts, for understanding and controlling CWD. First discovered here in 1967, the disease has been found intermittently in the wild, but has appeared in greater numbers in the last three years as captive elk and deer and their products move along the game-trade interstate.

Scientists hypothesize that the disease is passed through the various fluids of close-living captive herds. So, they reason, if saliva, mucous or even antler velvet could spread the disease within captive herds, then wild herds — which often make contact with captive animals through fences — could easily pick up the prion. And once it reaches the wild, there is, theoretically, no stopping the spread.

In the field, the work is bloody for the Division of Wildlife. The agency's most recent eradication site is a five-square-mile area radiating out from the infected Motherwell Ranch near Craig, Colo. (HCN, 4/15/02). There, 24 officers armed with rifles fan out from the "hot spot" site of infection, shoot any deer or elk they encounter, and haul the bodies to a tent erected at a central location. Wearing rubber gloves, officers cut off the heads, discarding the bodies in a pile for later incineration. They use a small instrument to scoop out a sample of the brain



THE SOFTER APPROACH: Veterinarian Lisa Wolfe takes a blood sample from a buck deer in Estes Park, Colorado, with the help of biologist and field coordinator Thomas Baker. The deer was tagged and had tonsil tissue removed to test for chronic wasting disease (Glen Martin photo, The Denver Post).

tissue, which is sent in a test tube to a research facility for analysis.

The heads are then piled with the bodies, thrown into a deep ditch and incinerated with the help of a large blower fixed on the lip of the pit that can bring the temperatures to nearly 2,500 degrees Fahrenheit.

"If we detect the disease in a wild herd, we'll keep killing along the radius until we no longer find it," Malmesbury says. "Our goal is to reduce prevalence of CWD to less than 1 percent."

As extreme as this seems, the goal of 1 percent isn't enough, says Dr. Valerius Geist, a renowned Canadian wildlife biologist and consultant during the recent CWD outbreak in Saskatchewan. "This is the next best thing to BSE. ... The goal should be total eradication," he says. "I have difficulty accepting that after you've murdered 50,000 deer, the infection is still there."

Geist suggests that officials cull animals in every place that CWD has

ever been found. Otherwise, he says, the effort is moot.

Softer approach

But getting all of the state agencies responsible for wildlife and disease control to commit to an aggressive eradication plan won't be easy. Currently, the state of Wyoming and Colorado's Rocky Mountain National Park are taking Southwick's approach: watching their herds, live-testing animals, and culling the animals that show clinical signs of the disease.

This softer approach may cause more problems for state officials trying to completely control the disease in other areas, because infected elk or deer in Wyoming and in the national park could easily wander into eradicated regions, reinfesting the "cleansed" populations. This is especially the case right now, Southwick says, as the drought forces herds to forage across a broader territory of scarce vegetation.

In addition to these soft geographic borders, unregulated products used by

hunters, such as mail-order urine and fecal "scents" farmed from captive elk and deer, may be spreading the prion, and bringing it in contact with humans.

All these problems, everyone agrees, could be eased by the development of an easily administered, inexpensive CWD test for both live and dead animals. Hunters could use it to test their kills, captive-elk breeders could monitor their herds, and wildlife officials could expedite their tests to keep a stricter surveillance.

Right now, only two tests exist: a live test, developed by the Colorado Division of Wildlife, which examines tonsil tissue of infected deer, one of the "highly metabolized" tissues where prions collect; and the postmortem test that uses brain tissue, the test employed by the DOW.

Unfortunately, the tonsil test doesn't work on elk, and is inefficient for wild populations. "The problem," says O'Rourke, "is that you have trouble getting a wild animal to come back for its repeat appointment." And the brain-tissue test is too expensive and too complicated for hunters and most captive herd ranchers.

Future progress may lie with private biotechnology firms. Following the expensive and catastrophic impact of BSE in Europe, numerous profit-seeking firms have become interested in developing the first cheap, easy prion test. One company, Prion Developmental Laboratories, based in Illinois, is developing a simple "strip test" to detect the disease in elk or deer urine.

In the meantime, both sides of the CWD eradication strategy wrestle their opinions through committee hearings in Washington, D.C., and in local "hot zones," like Livermore where Shirley Parrish and some of her neighbors are forming a concerned citizens' group.

At the least, the group hopes to force state officials to inform locals the next time they plan to burn a pit of animal carcasses in the neighborhood. ■

Lolly Merrell is *High Country News'* senior editor.

YOU CAN CONTACT ...

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HOTLINE

WASHINGTON

Duwamish? Duwamish who?

The Duwamish, a Northwest tribe, doesn't exist, according to Interior Secretary Gale Norton.

Since 1978, the tribe has been seeking federal recognition that would grant them control over their government and lands, make them eligible for federal funds for education, health care and social programs, and allow casino operations.

The 560 members of the tribe thought the matter was settled in January 2001, when a Clinton Interior Department appointee signed an order granting them tribal status. But in September 2001, the Bush administration reversed the Duwamish order because of a technical glitch: The outgoing Bureau of Indian Affairs director signed two of the three copies of the official notice after he had already left office. The Duwamish appealed the negative determination, but in early May, Norton declined to reconsider the decision.

Norton's May letter to the assistant secretary of Indian Affairs concludes that "further review is not likely to change the determination against acknowledging the Duwamish as an Indian tribe."

The tribe says this is unfair. It met all the criteria required for federal recognition — including proving its continuous existence from first contact with white settlers all the way to modern times.

The tribe is now seeking community and congressional support and plans to pursue legal recourse, but its future remains uncertain.

"They've become refugees on their own land," says Ken Tollefson, an anthropologist who has worked with the Duwamish since 1986. "The leaders are burning out, the researchers are dropping out, and the elders are dying out." — *Laura Paskus*

NATION

Interior's conflicting interests

Deputy Interior Secretary J. Steven Griles is in a pickle.

Last month, the U.S. Environmental Protection Agency effectively delayed the drilling of 39,000 coalbed-methane wells in Wyoming's Powder River Basin — a major energy project Griles and the Bush administration had hoped to expedite (HCN, 11/5/01). The EPA rated Interior's environmental impact statement draft "environmentally unsatis-

factory" (the worst possible rating), thereby requiring either a major rewrite, or a new document — either of which could delay drilling until 2004, well past Interior's goal of this September. In response, Griles sent the EPA a memo, urging the agency not to hamper methane development.

Now environmental groups are pointing fingers at Griles, and shouting, "Conflict of interest!" They claim he violated ethics rules by breaking a contract he signed in August, in which he agreed not to participate in official matters that could financially affect personal matters. Griles, a former oil and gas lobbyist, has represented energy industry big-wigs such as Arch Coal, Chevron, Occidental Petroleum, and Western Gas Resources, several of which have a major stake in the Powder River project, and are clients of a company formerly owned by Griles.

"Griles comes from the coal industry — he's worked for coal companies," says Kristin Sykes of Friends of the Earth. "He's got a personal interest in this."

Interior's lawyers say Griles did not violate his ethical contract, but have had him sign another — to "reemphasize" the first. Friends of the Earth plans to file a formal complaint with the Inspector General's Office. — *Jon Waldman*