

Ouch! Taking a shot at plague

July 16 2008

Endangered black-footed ferrets, like children, aren't exactly lining up to be stuck with a vaccine, but in an effort to help control an extensive outbreak of plague in South Dakota, some of the ferrets are getting dosed with a vaccine given by biologists.

This is the first time the vaccine has been used during a major plague epizootic – an animal version of a human epidemic. Sylvatic plague is an infectious bacterial disease usually transmitted from animal to animal by fleas. This exotic disease is usually deadly for black-footed ferrets and their primary prey, prairie dogs. Black-footed ferrets are one of the rarest mammals in North America.

In mid-May, the Centers for Disease Control confirmed sylvatic plague in black-tailed prairie dog colonies in the Conata Basin area of Buffalo Gap National Grasslands in southwestern South Dakota. As of late June, about 9,000 acres of prairie dog habitat -- including colonies occupied by vulnerable black-footed ferrets -- have been infected by the disease, according to U.S. Forest Service mapping. Black-tailed prairie dogs are also being reconsidered for listing under the Endangered Species Act.

Ferret population surveys in the fall of 2007, before the outbreak, indicated at least 290 ferrets lived in the Conata Basin ferret reintroduction area. Some of the plague-impacted prairie-dog colonies were occupied by ferrets, but researchers do not know yet how many ferrets have died from the outbreak. Scientists report that in the past, such outbreaks have wiped out entire colonies of prairie dogs and the black-footed ferrets that depended on them for food.

To help increase ferret survival during this outbreak, biologists are vaccinating wild ferrets to provide immunity if they become exposed to plague. The plague vaccine was developed for humans by the U.S. Army Medical Research Institute for Infectious Disease and is being tested and modified for animals at the USGS National Wildlife Health Center (NWHC) in Madison, Wisc.

"Although the plague vaccine is still experimental in wildlife, we hope its use during this epizootic will protect as many ferrets as we can capture in the field and boost ferret survival during this critical period," said USGS NWHC Research Chief Dr. Christopher Brand.

Prairie Wildlife biologists working with the federal agencies have captured and vaccinated 40 black-footed ferrets since the outbreak began, said Scott Larson with the U.S. Fish and Wildlife Service, who is coordinating measures to conserve ferrets among the federal agencies.

Dr. Tonie Rocke, the lead researcher at the USGS NWHC testing the vaccine for animals, said the vaccine is administered to prairie dogs and black-footed ferrets through an initial shot and a booster about a month later. She noted that the NWHC is working on a separate oral vaccine for prairie dogs that can be put into bait and delivered in the field without having to handle the animals, a process that is time-consuming.

Another strategy to control plague outbreaks is to apply insecticide that will reduce the flea populations in the prairie dog colonies that are important to black-footed ferrets, but that have not yet experienced plague die-offs.

Dr. Dean Biggins, a research ecologist and black-footed ferret expert at the USGS Fort Collins Science Center in Colorado, is collaborating with the NWHC to investigate the combined efficacy of dusting burrows with insecticide and vaccinating animals in the field. "We've had experience

with burrow dusting in other areas, and we know dusting protects both species from plague during these outbreaks," Biggens said.

Field tests, said Biggens, showed that the combination of burrow dusting and experimental vaccine protected black-footed ferrets in Montana during a time of low-level plague mortality in the area.

"What we're trying to do in South Dakota is assess the protectiveness of the vaccine for prairie dogs and ferrets during a full-blown eruption of plague that is causing high mortality in the prairie dog population," Biggens said. About 75 prairie dogs were experimentally vaccinated in 2007 in South Dakota, and vaccination is continuing in 2008.

The U.S. Fish and Wildlife Service, U.S. Geological Survey, Animal and Plant Health Inspection Service, National Park Service, and the U.S. Forest Service are working together to lessen the impacts of this outbreak, as are private organizations such as Prairie Wildlife Research and conservation groups, including World Wildlife Fund, Defenders of Wildlife, and the Prairie Dog Coalition.

The same bacterium that affects ferrets, prairie dogs, and other rodents, is also responsible for human cases of plague. The disease is transmitted from animals to humans by bites of infected fleas, but it can be cured with antibiotics if treatment is prompt. About 5 to 15 people are infected by plague each year, and it is not unusual to have some human fatalities as a result. Last November, a National Park Service biologist contracted plague from a cougar and died.

Source: United States Geological Survey

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