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# Plague Imperils the Recovery of Threatened and Endangered Species

***Plague is limiting the successful reintroduction of the black-footed ferret into its native southwestern habitat.***

*Endangered black-footed ferret*

Plague is a bacterial disease of wild rodents that is transmitted by fleas. It can afflict humans as well as other mammals, including the endangered black-footed ferret and five species of prairie dogs, the ferret's primary food source. The disease can rapidly decimate prairie dog colonies with mortality rates as high as 90-95%. The population of at least one species, the Utah prairie dog, is considered threatened, and another, the black-tailed prairie dog, is under consideration for listing as a threatened species. Moreover, recent information indicates that the ferrets themselves are highly susceptible to this disease. The occurrence of plague in prairie dog populations, and its potentially devastating effect on black-footed ferrets, have made it a major impediment to the ferret recovery programs of the Bureau of Land Management, the Fish and Wildlife Service, the National Park Service, and numerous state agencies.

*Black-tailed prairie dog*

The USGS National Wildlife Health Center, in collaboration with other Federal land management agencies and the Department of Defense, is conducting research on the potential for immunizing black-footed ferrets, prairie dogs, and other reservoir rodent species against plague infections. Recent advances in molecular biology and vaccine development have resulted in recombinant agents that protect laboratory mice from plague and might prove useful for vaccination of wildlife. Studies are currently being conducted at USGS to test the efficacy of two vaccines for plague in black-footed ferrets and prairie dogs. Preliminary results suggest that ferrets can be successfully immunized against plague by parenteral injection and immunization. Vaccination could be used to protect ferrets in captive breeding and release programs, as well as animals captured in the wild.

Mass immunization of free-ranging animals such as prairie dogs and other wild rodents is more challenging, and requires novel delivery mechanisms. Studies are currently underway at USGS to test the feasibility of oral immunization of wild rodents and to evaluate methods for oral delivery of vaccine. Preliminary results are very promising; prairie dogs that voluntarily consumed vaccine-laden baits were successfully immunized against plague. These studies could ultimately pave the way for management of plague in areas where the disease threatens the recovery of black-footed ferrets and prairie dogs and in locations where the risk of plague exposure in humans is significant, such as national parks and urban areas.

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