

Sylvatic Plague Vaccine (SPV)

Sylvatic plague, introduced into North America around 1900 and caused by the bacteria *Yersinia pestis*, is a disease transmitted primarily by fleas that afflicts many mammalian species, including humans.

Prairie dogs are particularly susceptible to plague and can suffer high mortality rates (>90%) during outbreaks. Plague may exist in an enzootic state in some prairie dog colonies contributing to decreased survival of prairie dogs in the absence of plague outbreaks. Conservation of prairie dogs has important consequences for many species of wildlife in the grassland ecosystem that depend on prairie dogs for food or use their burrows and colonies for shelter, nesting sites, and foraging.



Black-tailed prairie dog

Dean Biggins, USGS



Utah prairie dog

USGS NWHC

SPV, developed by scientists at the USGS National Wildlife Health Center and the University of Wisconsin, is a recombinant raccoon-pox (RCN) virus-vectored vaccine (RCN-F1-V307) that expresses the F1 capsular antigen and a truncated form of the *lcrV* gene (V307) of *Y. pestis* and is delivered orally by edible baits. RCN is a highly attenuated virus and is safe for prairie dogs and other species that may ingest or encounter the baits based on prior research of RCN in numerous species, including mice, dogs, cats, and sheep.



Burrowing owl



Mountain plover



Black-footed ferret



Swift fox

In laboratory studies, 60 to 85% of prairie dogs survived challenge by *Y. pestis* after consuming baits containing SPV only one time. Significant protection against challenge with *Y. pestis* was shown to last for at least 9 months.

SPV is incorporated into peanut butter-flavored bait matrix for oral delivery to prairie dogs.



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Baits contain a biomarker, Rhodamine B, providing a safe, non-lethal way to determine if an animal has eaten a bait.



Dan Tripp, Colorado Parks and Wildlife

A whisker from a prairie dog that ate a bait with Rhodamine B is luminescent under a fluorescence microscope.



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Field studies to assess the biosafety and efficacy of SPV began in summer 2012. Eventually, SPV may be implemented as a tool to manage plague in prairie dogs in targeted areas.

SPV could be used as a preventive tool in areas of conservation concern, especially in areas where enzootic plague decreases survival of prairie dogs and black-footed ferrets. SPV may become a useful tool to control plague that will help keep prairie dogs and other dependent wildlife species off the endangered species list.