

FIGHTING DISEASE WITH FIRE: PRESCRIBED BURNING WITHIN PRAIRIE ECOSYSTEMS



Figure 1. A prescribed burn across a prairie. Photo by dvande.

In the Great Plains, one of the most urgent threats to prairie ecosystems is disease outbreak, especially sylvatic plague.

The Oriental rat flea is a vector of sylvatic plague, an infectious and often lethal disease to many terrestrial mammals. This includes prairie dogs, a keystone species, and black-footed ferrets, an endangered mammal in North America. Sylvatic plague can ripple across ecosystems, decimating critical animal populations.³ Prescribed burning has emerged as a promising strategy to reduce flea populations and lower the risk of plague. As suggested by Zwolak et al. (2013), fire can reduce critical flea habitat and thereby reduce flea populations post-fire.^{6,10} In Montana mixed conifer forests, fleas were reduced by 70% in burned

areas.¹¹ In a broader review of 24 studies including grassland sites, Scasta (2015) found consistent evidence of fire reducing parasites and disease. Importantly, plague can also affect people. Infected fleas have the potential to transmit disease to humans directly or via contact with an infected animal. Recently, an Arizona resident became infected and died from pneumonic plague, a severe lung infection ([source](#)). Strategies that can reduce flea populations and prairie dog infections – including prescribed burning – can also benefit human communities in areas where plague is present.

KEY TAKEAWAYS

- 1 Research shows prescribed burning can significantly reduce flea populations, lowering the risk of plague.
- 2 Plague outbreaks threaten critical prairie ecosystems, and even local human communities.
- 3 Prescribed fire is a science-backed land management strategy used by trained professionals to support prairie health, biodiversity, and local communities.
- 4 Prescribed burning has the added benefits of reducing invasive plants, increasing biodiversity, supporting rangelands, reducing wildfire risk, and creating disturbance for fire-dependent ecosystems.



Figure 2. Buffalo Gap National Grassland stretches from Kadoka, SD all the way to the tri-state border of South Dakota, Nebraska and Wyoming. The national grassland abounds with wildlife year-round and provides forage for livestock. Photo by Charity Duggin, USDA.

Prescribed burning is a carefully planned and controlled fire intentionally set to manage landscapes more safely.

Fire has been used for centuries to maintain prairie ecosystems and continues to be used by Forest Service personnel in National Forests and Grasslands across the country. The use of fire as a land management strategy has a long history among Indigenous communities to increase plant health, renew grasslands, and support wildlife populations. Many ecosystems have evolved with fire; without fire, prairies can become overgrown with shrubs or invasive species, losing critical plant, bird, insect, and mammal diversity. Restoring fire to fire-dependent ecosystems can help reduce disease in both animals and humans, while supporting biodiversity and ecosystem health. Prescribed burning is a key management strategy for supporting the wildlife and communities of the Great Plains. Within National Forests and Grasslands, trained professionals conduct prescribed burns following strict safety protocols. In addition to reducing the risk of plague outbreaks, prescribed burning has several other benefits.

PREScribed BURNING BENEFITS

- a Controls invasive plants to help restore native grasslands.¹
- b Boosts bird and pollinator diversity.⁸
- c Supports rangeland productivity for livestock and wildlife.⁴
- d Reduces wildfire risk by removing excess vegetation that can fuel more dangerous, unplanned fires.⁵
- e Benefits livestock and wildlife by reducing ticks, chiggers, fleas, lice, and horn flies.⁹



Figure 3. Endangered black-footed ferret. Photo by Ryan Hagerty, U.S. Fish and Wildlife Service.

LEARN MORE

Learn more about the National Forests and Grasslands of the [Great Plains](#).

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