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Leafy spurge: Biting back in North Dakota

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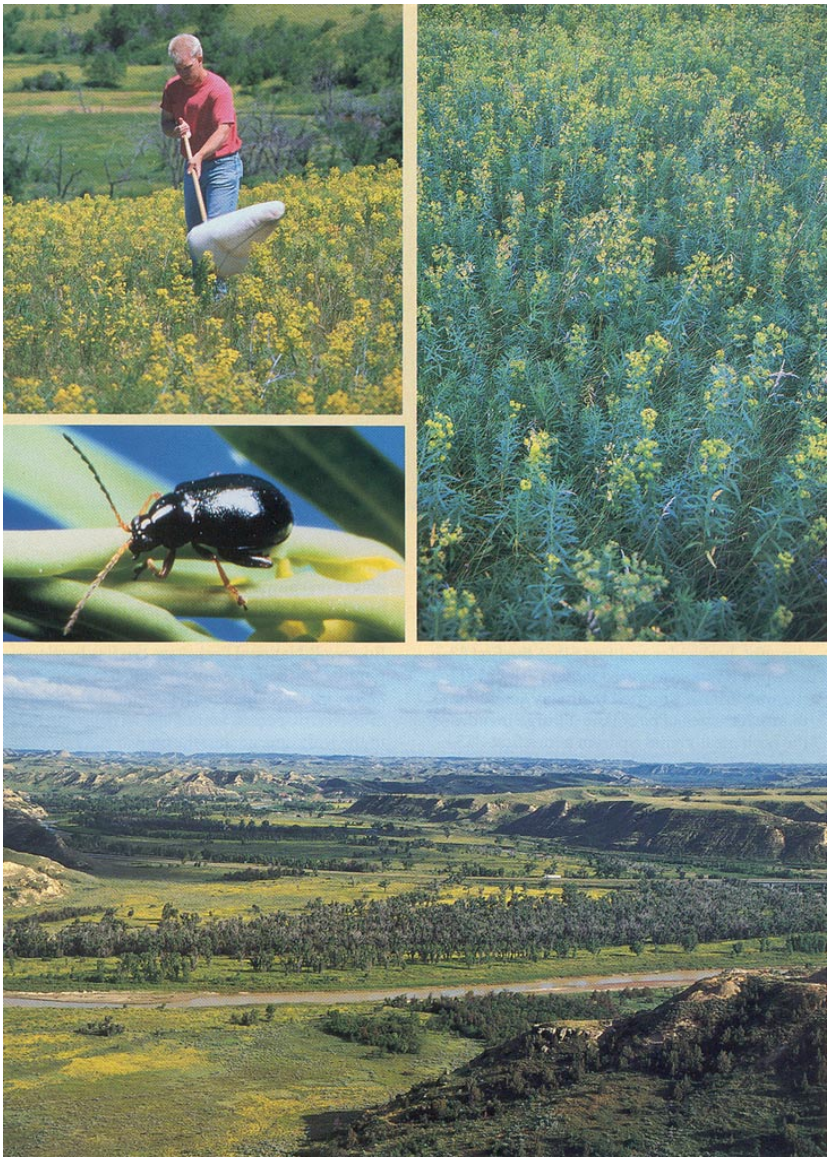
To the untrained eye, the calico pattern of yellow, green and brown that covers the slopes, creek bottoms and brushy draws of Theodore Roosevelt National Park in western North Dakota looks as natural as a prairie sunset. But this isn't the same view our 26th president saw when he first visited the area in September 1883. The Little Missouri Badlands where Roosevelt ranched and hunted has a new addition, an alien invader that threatens the native plant and animal communities of this remnant prairie landscape.

This unwelcome guest is leafy spurge, a two-foot-tall, yellow-topped Eurasian immigrant that has made a slow creep westward since it first put down roots in Massachusetts around 1827. This noxious weed now covers almost 5 million acres of the U.S. and Canada, and despite attempts to stop the weed with herbicides, fire, grazing and biological controls, spurge has tightened its grip on the land, doubling its coverage every five to 10 years.

The North Dakota Game and Fish Department has declared leafy spurge the greatest threat to wildlife in the state, and the National Park Service lists invasion of exotics as the greatest threat to the national park system. The effects of this pernicious perennial reverberate throughout the agriculture- and tourism-based economies of the West. Estimates of annual impact from the loss of wildlife-related recreation and agricultural production are a staggering $144 million for the four-state area of North Dakota, South Dakota, Montana and Wyoming alone.

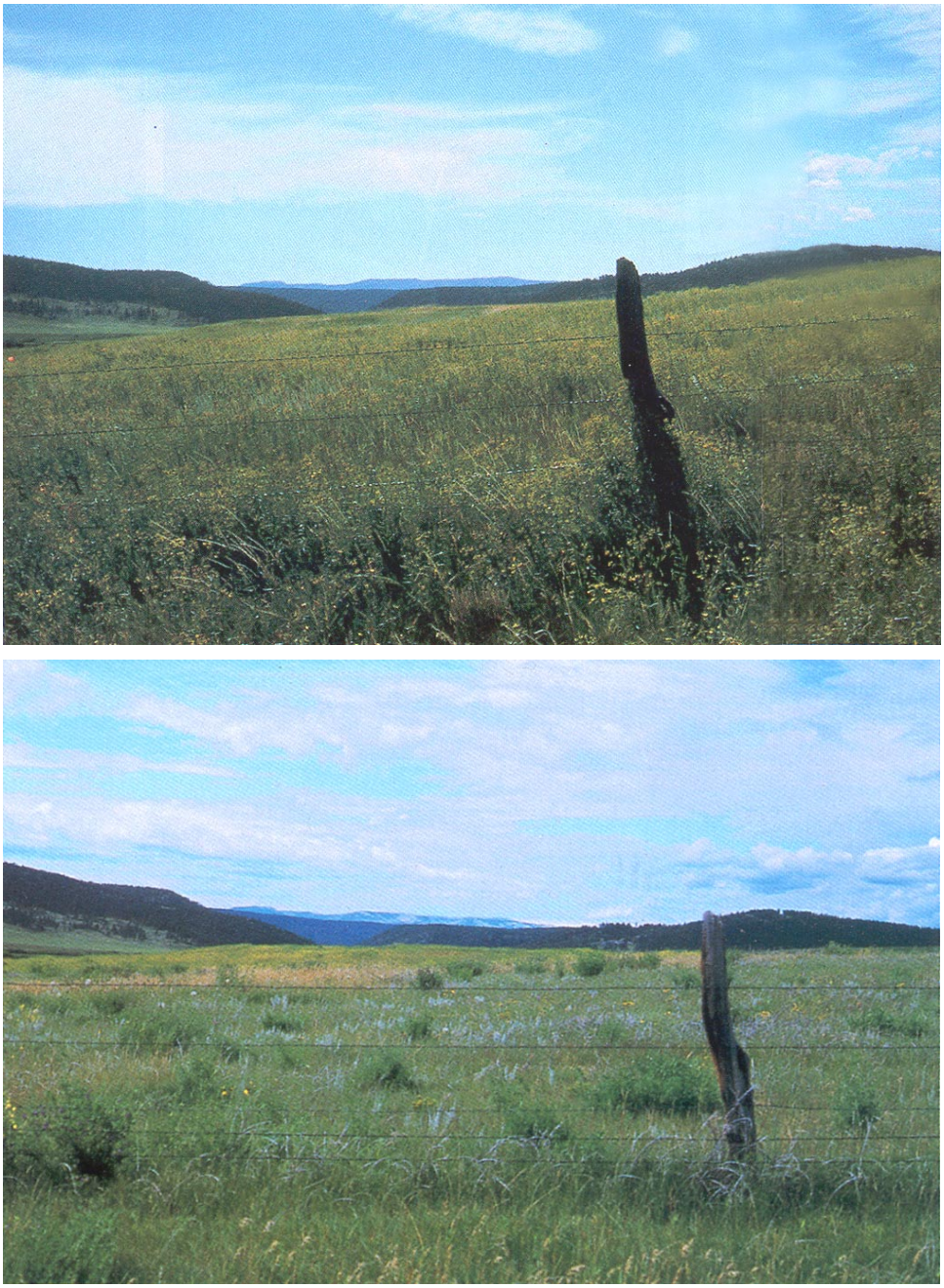
Spurge decimates native plant populations when it invades. Sprouting in thick patches before most native plants come up in the spring, it chokes out grasses, sedges and forbs. The plant's caustic milky sap makes it nearly inedible for most wildlife, and its 26-foot-deep, thick-barked roots make it extremely resistant to drought, herbicides and fire. Since the first 32-acre patch was discovered in the park in 1972, the weeds have stomped their way across more than 4,200 acres of park land. Spurge invades the ecologically vital riparian zones first–75 percent of the spurge in the park is within 200 meters of creek channels–displacing crucial forage on which elk, bison, deer and many other species depend.

Park officials tried to fight the invasion with aerial and spot spraying, while ranchers on neighboring lands and state and federal land managers supplemented Tordon with sheep and goats. But spurge colonies continued to sprout like strip malls, hopscotching to new areas in and around the park.



Courtesy Theodore Roosevelt National Park (center: flea beetle); Kelly Krabbenhoft (top left: sweeping); Gary Leppart (topright and bottom: leafy spurge)

In 1988, though, two new weapons were added to the arsenal: black and brown flea beetles. Host-specific insects from Eurasia, flea beetles feed on the roots of leafy spurge during their larval stage and on the foliage when mature. While the insects have taken 11 years to reach population densities that have measurable effects on spurge, land managers say the tide may be turning.



In 1989, leafy spurge had all but taken over these fields near Grass Range, Montana (top). Four years after the release of Eurasian spurge-eating beetles, the noxious weed has been knocked back and native grasses are once again flourishing, restoring habitat for elk and other wildlife. (Photos courtesy of Norm E. Rees).

Paula Andersen, a scientist with Theodore Roosevelt National Park, says the flea beetle populations have finally grown large enough and, with the help of park personnel and local ranchers, dispersed far enough to cut some holes in the leafy spurge invasion.

"We're seeing landscapes being changed at this point," Andersen said. "You can look at a whole hillside that was spurge that is now great graze. I'm a definite believer."

The large-scale changes seen throughout the park are, according to Andersen, a result of the integration of insects and herbicides. The herbicides weaken the plant, while the insects' larvae eat away at root material and drag naturally occurring soil pathogens into the already-weakened plant. One of the keys to the beetles' success, Andersen said, has been actively collecting and distributing them from successful colonies to other spurge patches.

Since 1995, the Rocky Mountain Elk Foundation has been an important part of this process. The Elk Foundation provided funds to purchase beetles in the early stages of the biocontrol program and paid expenses for two assistants who mapped spurge populations and dispersed flea beetles. The Foundation continues to sponsor Spurgefest, an annual collection and giveaway that provides free beetles to area ranchers and land managers. The program distributed nearly 20 million insects in 1999 and has helped spread the insects over a much larger area than they could cover through natural dispersal.

Tom Toman, conservation programs manager for the Elk Foundation, said the Foundation has been involved with Theodore Roosevelt National Park since sponsoring the Leafy Spurge Strategic Planning Workshop in 1994.

"Combining insects with other controls is really showing an impact," Toman said. "Our involvement helps make those things possible."

Toman said weeds can be so devastating to elk habitat that successful weed control can be just as important as a land acquisition or conservation easement.

"It doesn't matter if we lose a piece of land to a subdivision or weeds, it still has the same effect on elk," he said.

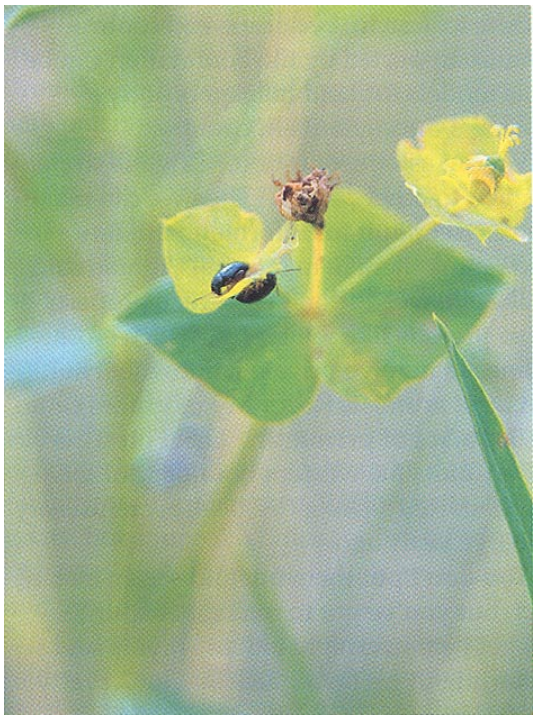
The Elk Foundation is in a unique position, according to Toman, because weed control programs supported by the Foundation can be used as models for land managers and landowners throughout elk country.

"We can ask the question, 'Can this strategy be applied to other places?' Then we can make ourselves a conduit for information that can be passed on to other elk managers," Toman said.

Like elk, weeds don't recognize property lines, so projects like Spurgefest which cross fencelines to involve private landowners hold the greatest promise. Roger Myers grazes cattle on 10,000 acres of private and U.S. Forest Service land that abuts the western boundary of the park. He started sicking flea beetles on his leafy spurge five years ago.

"You don't put them out and see an instant impact, but you've got to remember spurge didn't get here overnight either," Myers said. "I'm starting to get some sites that look pretty good."

Top photo courtesy of Gary A. McVicker. Bottom photo courtesy of Kelly Krabbenhoft.



Using flea beetles he's collected himself and those gathered on park lands, Myers has turned the voracious bugs loose at more than 2,500 sites. After five years of beetles munching the roots and leaves of the leafy spurge on his first release site, he said the results are amazing. The five-acre site was almost 100 percent spurge before he planted flea beetles. Now, grasses dominate about 95 percent of the area and it doesn't look like the spurge is coming back.

Myers acknowledges that leafy spurge is probably here to stay, but he believes the beetles could relegate spurge to a different role in the prairie ecosystem.

"I'm always going to have a few spurge plants, but just like sage or anything else, it is just going to be part of the community," he said.