18 Horse-mounted sprayers: an innovative tool for backcountry weed treatment

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The 244,000-acre Badlands National Park is characterized by rugged badlands topography interspersed with a remnant of the native mixed-grass prairie that once blanketed the northern Great Plains. While visually resembling the vast prairie of the past, the park's grasslands include several species that did not greet the pioneers. These invasive plant species are the targets of the park's integrated weed management program.

The objectives of the Badlands weed management program are to:

- Prevent the introduction of new invasive plant species.
- Eradicate new infestations.
- Reduce the 8,000 acres of Canada thistle *(Cirsium arvense)* using chemical and biological controls.
- Confine and reduce the 20 acres of Russian knapweed *(Centaurea repens)* populations using chemical control.
- Reduce the 3,000 acres of common mullein *(Verbascum thapsus)* using chemical and mechanical controls.
- Reduce the field bindweed *(Convolvulus arvensis)* population using chemical control.
- Reduce Kentucky bluegrass *(Poa pratensis),* crested wheatgrass *(Agropyron cristatum),* and bromes *(Bromus inermis, B. japonicus, B. tectorum)* using prescribed fire during springtime.
- Complete global positioning system (GPS) mapping of targeted weeds using a standard data dictionary; monitor populations to assess effectiveness of control program.
- Monitor for invasion of new weed species, particularly leafy spurge *(Euphorbia esula)* and tamarisk *(Tamarisk ramosissima).*
- Maintain or plant native species to prevent invasion and re-invasion by non-native species.
- Support research related to weed control, particularly control of yellow sweet clover *(Melilotus officinalis)* and halogeton *(Halogeton glomeratus).*

Much of the park is inaccessible or poorly accessible to motorized equipment due to wilderness designation or rugged topography. As a result, efficient herbicide application has been a challenge since the weed management effort was first initiated in 1983. In the past, most backcountry herbicide application was accomplished using 5-gal backpack sprayers. For the most remote infestations, this would require a 3- to 4-hour hike into the treatment area carrying a 50-lb sprayer pack, less than an hour of spraying to exhaust the 5-gal tank, and a 3- to 4-hour hike back out. In areas that require less hiking time, it was possible for one biotechnician to apply two sprayer tanks in a workday. This application method was very inefficient and exhausting to the park's biotechnician crew, particularly in the heat of summer while wearing tyvek coveralls, nitrile overshoes and gloves, and a respirator. As a result, most of the

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park's effort was concentrated in the more accessible frontcountry areas and weeds in the backcountry were left primarily to biological control or no control at all.

In the spring of 2000, the park decided to try an animal-mounted sprayer unit called a Saddle-Light. Based on a design pioneered by Harley Bauer, the former weed supervisor in Ravalli County, Montana, the unit was field-tested and refined by Tom McClure and Hal Pearce of the Blanco Ranger District of the White River National Forest in Colorado. Numerous other people and organizations were involved in tweaking the design and making it available for distribution on a non-profit basis. Currently, it is available for sale from the White River Soil Conservation District.

For $500 plus shipping, the basic unit includes:

- Four recycled 5-gal soda canisters;
- One 5-lb carbon dioxide tank;
- A hand wand and nozzle with a 12-ft hose;
- Custom -designed panniers that are lightweight, durable, and non-absorbent;
- Extra fittings, o-rings, and other items for routine maintenance; and
- A user's guide.

You supply:

- A pack animal, capable of carrying 200 lbs, that has a good disposition, will stand, and can become accustomed to the hissing sound made by the equipment.
- A pack saddle. We use a nylon saddle and a heavy-duty cinch.
- A saddle blanket. We "dedicate" one to this use to avoid potentially contaminating all the saddle blankets with herbicide.
- A saddle bag with extra gaskets, tools, spare parts, eye-wash kit, and extra gloves.
- Herbicide.

In our experience, the Saddle-light sprayer improves our efficiency in backcountry herbicide application by about 500%, in two ways:

1) ***Quadruple the herbicide load.*** The pack can carry 20 gallons of tank mix, which is four times the amount that can be carried in a backpack sprayer. This greatly reduces the number of trips needed to transport the mixed herbicide into the treatment site. Due to the high amount of suspended solids found in natural waters in the Badlands, we do not refill in the field. However, the system is designed to allow the applicator to carry a jug of concentrated herbicide so that water can be dipped from a stream or lake to mix with the concentrate and thus refill the canisters in the field, thereby potentially eliminating the need to make more than one trip per day.
2) ***Quicker transport.*** Horses and mules walk faster than humans, so riding into the treatment area is faster than hiking in. In treatment areas that are within a half-mile of a road—which in the Badlands means generally the edges of the wilderness—our biotechnicians find it convenient to just walk in leading the pack animal. In more remote areas, they ride a saddle horse and lead the pack animal. Once near the treatment area, the saddle horse is hobbled and the biotechnician and pack animal go to work.

We found this equipment so valuable we purchased three more Saddle-light sprayers and are planning to purchase mules to dedicate to this use.

Chemical treatment is one of three methods in our integrated weed management program, and the Saddle-light is one of three chemical application methods used. In short, it is a piece of the program, but a very important piece if we are to reduce

weeds in the backcountry. The Saddle-light is used primarily to maintain a 0.5-mi-wide weed-free perimeter around the Badlands wilderness area. Over time, we hope to increase the width of the perimeter and begin treating more interior wilderness areas. For the present time, this perimeter control strategy helps address the concerns of park neighbors as well as state and county weed officials because fewer than 1% of Canada thistle seeds travel more than 0.5 mile. The Saddle-light sprayer is also used to treat weeds in prairie dog towns to improve habitat for the federally-listed black-footed ferret that has been reintroduced in the park. Most of the reintroduction effort has been concentrated in the Badlands wilderness area. Prairie dogs are unable to clip Canada thistle stems after they become woody, thus limiting sight distance for them and potentially harboring predators. The success of the ferret population is dependent upon a healthy prairie dog population, so the Saddle-light sprayer is used for endangered species habitat improvements. The Saddle-light also is used on a more limited basis to treat weeds in non-wilderness areas where the steepness of the terrain makes all-terrain vehicle (ATV) use unsafe and in highly visible areas where the use of ATVs would interfere with the visitor experience.

For purchase or additional information on the Saddle-light sprayer, contact: Hal Pearce, U.S. Forest Service, White River National Forest, Blanco Ranger District, 317 East Market, Meeker, Colorado 81641.