

Sage-Grouse Habitat Conservation Benefits Resulting from a Leafy Spurge Integrated Pest Management Program in Northeast Wyoming



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***Abstract:** Leafy Spurge (*Euphorbia esula* L.) is a highly competitive invasive weed. The invasive weed is well adapted to a wide range of habitat types, it's seen everywhere from riparian zones to dry upland hillsides. Historically, intensive chemical treatments have been used to reduce the economic impact of leafy spurge patches. Unfortunately the chemical treatments affect large areas of valuable sage-grouse habitat. Since most chemical treatments of leafy spurge are not species specific, the treatment type also affects sagebrush communities. Sagebrush communities are vital habitats for many of Wyoming terrestrial wildlife. The sage-grouse is one species of high concern because of the range wide population declines. Chemical treatments tend to favor grasses and reduce valuable forbs, sagebrush and other woody vegetation.*

Introduction

Biological control agents to manage pest and invasive weeds are not a new concept. The Chinese used predatory ants to control insect pests in food and citrus groves more than 2000 years ago. Since then we have learned a lot about biological control methods. Prior to releasing control agents for general use, considerable research is conducted. Ideally the target species is the only affected species.

Flea beetles were approved for use in 1985 to help control leafy spurge. The insect uses leafy spurge during all life cycles. Larvae feed on the rhizomes of the plant while the adults consume the leaves. This tag-team approach severely stresses the plant and reduces its vigor and reproductive capabilities. Flea beetles alone have been shown to reduce leafy spurge canopy cover by 95 percent.

Domestic goat and sheep grazing has also been shown to be an affective biological control agent in the management of leafy spurge. For instance, sheep and goats will readily browse leafy spurge. Goats may be the preferred species, however, since their dietary overlap with cattle is less and they require no training to prefer leafy spurge in their diet. Depending on stocking rates and spurge stand vigor these browsing animals can stress the plants, creating more opportunity for soil and air borne pathogens to destroy the plant.

Using sheep and/or goats to selectively graze leafy spurge while flea beetles are harming the plants has proven to be an excellent management combination against leafy spurge stands. In addition, the browsers tend to open up heavy stands of vegetation to create nurseries for the beetles and help spread the insects.

Methods

The Natural Resources Conservation Service (NRCS) Buffalo Field Office began photo-monitoring sites where goats and flea beetles were used to help control leafy spurge. These bio-agents were used in combination with light application rates of Tordon, as part of an Integrated Pest Management (IPM) program on several ranches. The IPM program is a cooperative venture between the landowner, Johnson County Weed and Pest District, Lake DeSmet Conservation District and NRCS Buffalo Field Office. The IPM program incorporated bio-agents in sagebrush habitat to minimize impacts to this valuable plant community. The objective was to use goats to stress leafy spurge and create an environment where flea beetles could be successful.

Results

The photographs and descriptions that follow document the success of this program.

Before – June 1999



After – June 2007



The “before” picture (top) shows the landscape-level impact that leafy spurge can have on a plant community. Once the IPM program was implemented, the “after” picture demonstrates how leafy spurge can almost be entirely removed from the system... with little or no harm to valuable sagebrush resources and associated forbs.

Before – June 1999



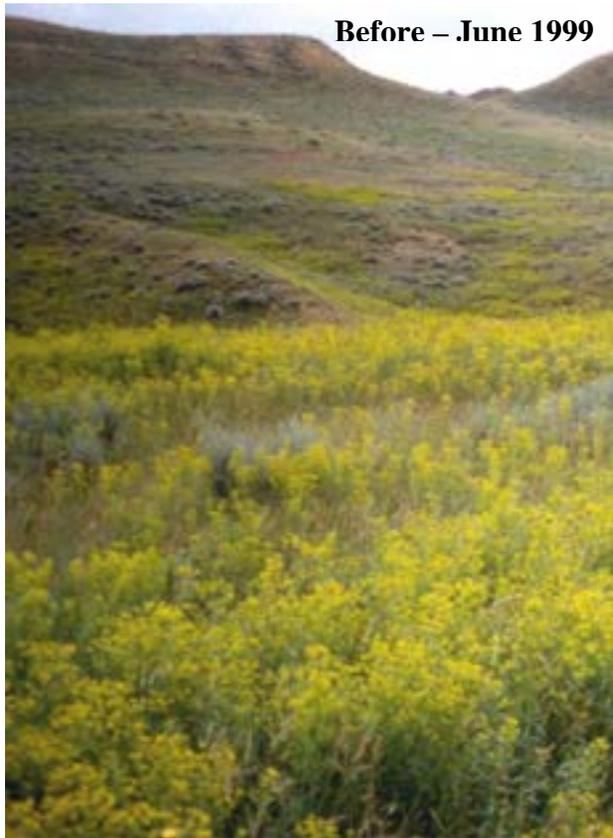
After – June 2007



This drainage shows another leafy spurge dominated landscape. The IPM program has almost eliminated this invasive plant from the area... within eight years!



The IPM program substantially reduced leafy spurge, although some patches persist.



In 1999 the area in this photo was infested with leafy spurge. After the IPM program, spurge is not seen and sagebrush appears to have responded positively.

Conclusion

In the second half of the 20th Century, numbers of greater sage-grouse have declined throughout their range. Eleven western states are working to conserve the species and their habitat. This has resulted in the initiation of many conservation-planning efforts. One of the primary factors identified for this decline is the loss and degradation of valuable sagebrush habitats.

These pre and post-photographic comparisons demonstrate how an integrated program of biological and chemical control methods can provide an effective alternative to traditional chemical-based practices (Figure 1). The IPM program not only controlled the invasive plant, but also conserved sagebrush resources in valued sage-grouse habitats in northeast Wyoming.



Figure 1. This picture taken in 2007 shows how higher rates of Tordon can reduce the number of sagebrush plants and the vigor of others. Decadent sagebrush plants are seen with leafy spurge scattered amongst them. Cheatgrass (*Bromus tectorum*) was also enhanced by this chemical-based program.

For information concerning this IPM program, contact Rod Litzel at the Johnson County Weed and Pest District in Buffalo, Wyoming at (307) 684-5715, Phil Gonzales at the NRCS Buffalo Field Office at (307) 684-2526 Extension 3 or Bert Jellison at the Wyoming Game and Fish Regional Office in Sheridan at (307) 672-8003 Extension 229.