

SAGEBRUSH

According to Jeff Mosley, MSU Extension Range Specialist, Montana is home to 16 different woody species or subspecies of sagebrushes and 11 different species of non-woody sagebrushes. Mountain and Wyoming big sagebrush are the two most common woody sagebrushes in Montana. Wyoming big sagebrush occupies lower elevation plains, while mountain big sagebrush occupies foothill and mountain rangelands.

Sagebrush occurs naturally on many western rangelands. However, sagebrush also has invaded vast areas and has become the dominant plant on former grasslands. In pristine Montana rangelands, sagebrush canopy cover averages about 15 to 25 percent. Sagebrush ecosystems naturally developed with periodic fires that limited sagebrush canopy cover and conifer encroachment and promoted understory plant growth. However today with fire suppression and other factors, large expanses of dense big sagebrush are taking over and have low value for livestock grazing and wildlife habitat. Sheep, goats, cattle, and horses often browse sagebrush plants when snow cover is deep, but generally livestock do not eat much sagebrush.

In contrast, eight species of Montana wildlife require sagebrush for their survival. These species are the greater sage-grouse, Brewer's sparrow, sage sparrow, sage thrasher, pygmy rabbit, sagebrush vole, common sagebrush lizard, and pronghorn antelope. Sage sparrows, Brewer's sparrows, and sage thrashers are songbirds that build their nests in sagebrush canopies. Pronghorns eat sagebrush in winter but prefer areas where sagebrush is short so that they can see predators at long distances. Much of the current concerns about sagebrush center on the greater sage-grouse, a large, ground-nesting bird also called a "sage chicken" or "sage hen."

Much of the decline in sage-grouse population across the West is due to direct conversion of native rangeland to other uses such as cities and towns, highways, pastures, or cropland. Major threats to sage-grouse also include invasive plant species, wildfires, conifer encroachment into sagebrush rangelands, energy development, disease, and predation. Predation is the most common reason for sage-grouse nest failure. Primary predators are coyotes, skunks, ground squirrels, magpies, and ravens, and predator densities have increased markedly during the past several decades. For example, since 1965, raven numbers have increased 225 percent across the west.

Many sagebrush rangelands in Montana no longer provide optimal sage-grouse habitat because sagebrush canopy cover is too great and understory forbs are too scarce. Sage-grouse generally prefer areas where sagebrush canopy cover is 25 percent or less, sagebrush plants are less than three feet tall, and the understory contains about 20 percent forbs and 80 percent grasses. Sage-grouse nests hide from predators, and seek shelter beneath sagebrush canopies, and sage grouse winter diets are almost exclusively sagebrush. In late spring and summer, however, juvenile sage-grouse seek meadows and openings without sagebrush where herbaceous vegetation is two to six inches tall, enabling juvenile sage grouse to find and eat highly nutritious weedy forbs and insects. Forbs also comprise 20 to 50 percent of the diets of pre-laying hens as they prepare to nest and reproduce. Excessive livestock grazing can harm sage-grouse, but light to moderate livestock grazing is ecologically sustainable in sagebrush rangelands and can benefit sage-grouse. For example, sage-grouse prefer juvenile-rearing habitat where vegetation height has been reduced by moderate livestock grazing, and sage-grouse prefer areas where moderate livestock grazing has increased the availability of succulent forbs.

Dense sagebrush canopy cover lowers sage-grouse habitat quality, livestock and wildlife forage production, and plant and wildlife diversity. Wildlife abundance and diversity are greatest where a mosaic combination exists of sagebrush canopy cover and a diverse understory of grasses, forbs, mulch-covered ground, and bare ground.

Controlling sagebrush so that it does not get over 25 percent can be important. Mowing, prescribed burning, or herbicides can be used to create and sustain the desired mosaic of big sagebrush cover. Thinning dense stands by mowing increases herbaceous production 150 to 200 percent. Prescribed burning can kill big sagebrush but needs to be thought out with the right humidity, temperature and head fires to control the burn. Winter feeding on sage also helps to knock back plants and puts organic matter into the soil.

Two herbicides, 2,4-D or Spike (i.e., tebuthiuron), are effective for controlling big sagebrush. Timing is critical when applying 2,4-D in the spring at a rate of two quarts of product per acre. About a 10-day window of opportunity exists each year when 2,4-D treatment can effectively suppress big sagebrush. This time period usually

occurs in late May to mid-June, when big sagebrush plants are actively growing, and new twigs are three to four inches long, Sandberg bluegrass is flowering, and phlox plants are forming seed. Timing of application is much less critical for Spike herbicide than 2,4-D. Spike can be applied anytime the soil is not frozen or snow-covered and is usually applied aerially. Sagebrush canopy can be reduced 50 to 75 percent by applying one to one and one-half pounds of Spike per acre. Three pounds of Spike per acre will provide complete sagebrush control. Thinning dense big sagebrush stands via Spike application usually increases herbaceous production at least 200 to 300 percent.

For more information contact the MSU Powell County Extension Office at 846-9791

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