



COOPERATIVE EXTENSION

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Greenstrips: Another Tool to Manage Wildfire

Jason Davison, Northeast Area Specialist
Ed Smith, Western Area Specialist

Introduction

Wildfires are becoming larger and more severe on rangelands in the western United States. Over 700,000 acres burned in Nevada during the 1996 fire season. The reason for this is changes in the amount and arrangement of the wildfire fuels such as grass and shrubs. The increase in the amount and arrangement of fuels is due primarily to the reduction in the number of livestock grazing these fuels and the successful fire suppression programs carried out by state and federal fire control agencies. Another important factor in range fires is the introduction and spread of non-native annual grasses such as medusahead rye and cheatgrass. These plants become dry earlier in the season, providing ideal fuel conditions for the ignition of wildfires. They also grow in a continuous mat which allows fire to spread rapidly to the more widely spaced native shrubs and grasses.

While fire is an important component in the ecology of the western shrub and grasslands, current conditions are resulting in increased frequency and intensity in fires which can destroy the native vegetation over very large areas. The loss of the native plants allows non-native annual plants to completely dominate a site. This in turn results in the loss of wildlife species which depend on native shrubs and grasses to survive. It also reduces perennial forage for wildlife and livestock, provides an opportunity for noxious weeds to grow and increases the potential for rapid erosion and soil loss.

Greenstrips can be used to reduce the opportunity for man-caused fires to start or spread. They can reduce the size of wildfires and increase the effectiveness of the fire fighting effort, which reduces the cost. Greenstrips are also used to protect high value natural resources

What Are Greenstrips?

Greenstrips are long, narrow bands of fire retardant vegetation. Greenstrips are created by seeding plants that will:

- readily establish and persist
- be difficult to ignite
- burn with low intensity
- be tolerant of fire
- in some cases, be desirable wildlife and livestock forage

How Do Greenstrips Work?

Greenstrips work by reducing the chance of a fire starting and by slowing the rate that the fire spreads. Plants growing in a greenstrip are normally widely spaced with little or no fuel growing in between. This means that if one plant is ignited it is difficult for the fire to spread to other nearby plants. If an existing fire spreads to a greenstrip the intensity of the fire is substantially reduced. This is due to the decreased amount of fuel, shorter height, and/or low higher moisture content of the plants growing in the greenstrip. The speed that the fire is moving also slows rapidly when a greenstrip is encountered. The drop in intensity and speed allows firefighters a better opportunity to control and extinguish the blaze.

Where Should Greenstrips Be Planted?

Greenstrips are used in a number of ways. Some of the more common uses of greenstrips in Nevada include:

- adjacent to roads and railways to prevent ignitions from cigarettes and sparks from trains
- around individual homes or neighborhoods situated in high fire hazard rangelands
- "breaking up" large blocks of highly flammable, continuous annual vegetation
- protecting high value areas such as mule deer winter range, endangered species habitat, etc

How Big Are Greenstrips?

The width of a greenstrip depends on where it will be planted and the type of existing vegetation growing where it will be planted. In most of Nevada sagebrush- grassland- rangelands a width of 300 feet is recommended. This means about 36 acres per mile of planned greenstrip is required. The width of greenstrips planted next to roads or railways could be reduced by 50 to 100 feet depending on the width of the road or railway which is existing fuel breaks. Landscape features such as streams, rock escarpments, and/or low fire hazard plant communities (i.e. low sagebrush and meadows) can also be effective fuel breaks and would reduce or eliminate the need for a greenstrip. The length of a greenstrip is dependent on the area being protected and existing fire breaks which can be incorporated into the greenstrip.

How Are Greenstrips Established?

Establishing a greenstrip normally requires removing the existing vegetation, preparing a seedbed and seeding adapted plants. The existing vegetation should be removed to reduce the competition for water, nutrients, and light between the seeded species and the existing plants. This can be done mechanically using tillage equipment, by spraying with an herbicide or by burning. Each method has advantages and disadvantages. The method selected should be based on the size of the greenstrip, the existing vegetation, availability of equipment, economics, etc.

Seedbed preparation is often ignored in rangeland seedings. Although it is possible to establish a satisfactory stand without preparing the seedbed, seeding success is much greater with a properly prepared site. Proper seedbed preparation includes

removing competitive vegetation and preparing a firm but friable soil in which to plant the seed. Offset discs are often used as a first step to kill existing vegetation and loosen the soil. This operation may be followed with a cultipacking operation to lightly firm the upper soil level prior to planting.

Greenstrip seeding is most successful when the seeds are planted using a seed drill. Drills allow more precise control over the amount and depth the seeds are planted. The drill should have a press wheel behind the planting disc that firm the soil around the seeds after they are planted. This increases germination rates and seedling survival. Broadcast seedings can be successful, but require significantly more seed (usually 50 percent) and are more dependent on ideal climatic conditions for success. If broadcasting is necessary seeding success will rise dramatically if the seed is buried lightly. This may be done using harrows, cultipackers, tire drags, or log chains following the seeder.

What Should I Plant in the Greenstrip?

Greenstrips usually contain grasses with some forb and shrub species added to improve the visual appearance and value to wildlife. Some of the important requirements of plants used in greenstripping projects are:

- plants must be adapted to site characteristics
- an ability to establish in the presence of annual weeds
- grow as widely separated individual plants
- low height at maturity
- produce relatively low amounts of fuel
- remain green for long periods
- survive burning
- tolerate grazing by wildlife and livestock

Table I lists the most common plants used in greenstripping projects in northern Nevada and their important characteristics related to establishing greenstrips.

Does a Greenstrip Need Maintenance?

Greenstrips should be grazed or mown frequently enough to reduce the build up of fuels. If fuels are allowed to increase over time, the effectiveness of the greenstrip is reduced dramatically.

TABLE: 1. Common perennial plants used in greenstrips and selected characteristics important to their establishment and use

Grasses	Minimum Yearly Precipitation (Inches)	Salt or Alkali Tolerance	Status	Growth Form: Flower Color/ Season	Varieties
Crested Wheatgrass (Agropyron cristatum)	8-10	Moderate	I	Bunch	'Ephraim' 'Fairway'
Standard Crested Wheatgrass (Agropyron desertorum)	10-12	Moderate	I	Bunch	'Nordan' 'Hycrest'
Siberian Wheatgrass (Agropyron sibiricum)	8-10	Moderate	I	Bunch	'P-27'
Streambank Wheatgrass (Elymus lanceolatus)	8-10	Moderate	N	Sodformer	'Sodar'
Western Wheatgrass (Pascopyrum Smithii)	8-10	High	N	Sodformer	'Arriba' 'Barton' 'Rosanna'
Russian Wildrye (Psathyrostachys juncea)	10-12	Moderate High	I	Bunch	'Bozoiski Select' 'Vinall'
Canby bluegrass (Poa canbyi)	10-12	Moderate	N	Bunch	'Canbar'
Big bluegrass (Poa ampla)	10-12	Low	N	Bunch	'Sherman'
Sheep fescue (Festuca ovina)	10-14	Low	N	Bunch	'Covar' 'Durar'
Yarrow (Achillea millefolium)	8-10	Moderate	N	White/S, F	
Small burnett (Sanguisorba minor)	12-14	Moderate	I	Pink/S	'Delar'
Lewis flax (Linum lewisii)	10-12	Moderate	N	Blue/Sp	'Appar'
Palmer penstemon (Penstemon Palmeri)	8-10	Low	N	Light Pink Sp, S	
Forage Kochia (Kochia prostrata)	8-10	Moderate High	I		'Immigrant'
Fourwing Saltbrush (Atriplex canescens)	8-10	High	N		

References

The information used to develop this fact sheet was obtained from the following sources. They are recommended as sources of additional information.

- Back, Gary. 1994. *Elko Greenstripping Program Environmental Assessment*. BLM/EK PL- 94/001. U.S. Department of interior Bureau of Land Management. Elko, NV. 32 pages.
- Carlos, W., Freitas, TV., and MacDougall, Dick. 1986 *Establishing Fire Retardant Vegetation*. University of Nevada, Reno, University of Nevada Cooperative Extension Fact Sheet 86-3. 3 pages.
- Gebhardt, K., Boltz, M., Frazier, S., Mangan, L., Miller, M., Pellant, M., Rosentreter, R., and Taylor, deny. 1987. *Greenstripping Handbook*, Idaho BLM. US Department of Interior Bureau of Land Management, Boise, ID. 81 pages.