

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE SPECIFICATION

BRUSH MANAGEMENT

(ACRE)
CODE 314

I. SCOPE

The work will consist of furnishing material and equipment as required to remove, reduce, or manipulate non-herbaceous plants at levels to meet management objectives.

II. GENERAL REQUIREMENTS

On native rangeland areas, brush management treatments will be used to control, contain, or eradicate undesirable woody and/or succulent vegetation. Use Ecological Site Description (ESD) State and Transition model, to determine if proposed actions are ecologically sound and defensible. If an ESD model is not available, base design criteria on best approximation of native plant community composition, structure, function, and response potential. Treatments need to be congruent with dynamics of the ecological site(s) and are keyed to states and plant community phases that have the potential and capability to support the desired plant community.

The needs of wildlife will be considered when applying brush management practices. Species that need to be considered include, but are not limited to; pronghorn antelope, sage grouse and other grassland nesting birds, pygmy rabbit, mule deer, elk, as well as wetland or aquatic species that are associated with riparian areas, springs, seeps, or meadows associated with the treatment area. Consult the NRCS State Biologist if an on-site evaluation identifies possible wildlife habitat conflicts.

Prior to treatment all areas to be treated will have the following forms completed:

- NV-CPA-52 Environmental Evaluation
- NV-EVC-01 Cultural Resources Worksheet
- NV-ECS-01 Rangeland Inventory Worksheet
- NV-CPA-314 Brush Management Practice Documentation Worksheet
- NV-ECS-19 Wildlife Habitat Evaluation Guide for Grazed Range
- NV-ECS-34 Species Habitat Evaluation Guide for Sage Grouse when in Sage Grouse Range.

The following are associated practices that are commonly used in conjunction with brush management:

- Prescribed Grazing (528)
- Range Planting (550)
- Pasture and Hayland Planting (512)
- Prescribed Burning (338)

III. SPECIAL CONSIDERATIONS FOR SAGEBRUSH WITHIN SAGE GROUSE RANGE

For areas of native rangeland identified as sage grouse range, brush management will not be considered for any woody species unless the percent composition (by canopy cover) of the target species within the present plant community significantly exceeds that listed as potential on the associated ecological site description (approximately double the *average* percent composition listed in the ecological site description).

To provide optimum habitat for sage grouse and other sagebrush obligate species, treatments should be designed to thin the sagebrush canopy, remove patches of sagebrush to provide a mosaic of early seral vegetation within mature sagebrush stands, reduce the competition between mature sagebrush and the herbaceous understory, and increase the vigor, productivity, and diversity of herbaceous species (Connelly et al. 2000a).

Where treatment areas are adjacent to perennial streams, native meadows, and other wetland areas, an undisturbed (irregular-shaped) strip of land supporting natural vegetation (approximately 100-feet in width) will be left along each side.

Brush management for areas of seeded rangeland (i.e. introduced wheatgrasses) will be evaluated on a case by case basis in areas of sage grouse habitat. Approval from the State Rangeland Management Specialist and the State Biologist will be needed in this instance.

IV. INSTALLATION

A. MECHANICAL TREATMENT

Time of application is dependent upon the physiological life cycle stage of the species to be controlled, rainfall patterns, and seeding practices to follow treatment. Brush management operations will be timed to prevent the exposure of bare soil for long periods of time and to reduce erosion and sediment transport into adjacent water bodies.

Following some mechanical treatments, seeding of herbaceous vegetation will be required. ***Treated areas (brush control and/or seeded) will be deferred from grazing at least two full growing seasons following treatment*** to allow for recovery and/or establishment of desirable perennial herbaceous vegetation. In cases where weeds are abundant, a short period of grazing to reduce the weed crop will be allowed during the first two growing seasons. Approval from the State Rangeland Management Specialist and the State Biologist will be needed in this instance.

For additional guidance see Prescribed Grazing (Code 528) and Range Planting (Code 550) conservation practice standards and specifications.

In areas of sage grouse leks, nesting, and summer habitat, mechanical treatments will only be conducted in the fall or early winter.

1. Plowing and Disking

Species: big sagebrush, creosotebush, rabbitbrush, horsebrush, tamarisk, black greasewood, willow

Acceptable equipment: standard disk plow, wheatland plow, heavy offset disk (Towner disk), disk chaining, brushland plow, power grubbing, heavy sweep, and root-type plows equipment can be used.

Tillage equipment is only used on sites with relatively stone-free soils and level to moderate slopes with less than a 30 percent gradient.

Equipment will be operated at depths and at angles to ensure complete cutting of taproots and lateral roots of target species. Treatment will be sufficient to reduce target species composition as identified on NV-CPA-314.

For big sagebrush control, timing of treatment shall be conducted when soils are sufficiently dry so that partly covered plants will not initiate re-growth. In order to accomplish the desired percent reduction a follow-up treatment may be necessary.

2. Railing and Dragging

Species: big sagebrush and other nonsprouters

Acceptable equipment: Rails, pipe (Dixie) harrow, or other objects of various types and design that are heavy enough to obtain satisfactory kill of target species may be used. Motor grader and bulldozers, where blades are used for surface scalping, are also suited.

This method of control is not effective on crown-sprouting shrubs species such as snowberry, rabbitbrush, black greasewood, and silver sagebrush, or any woody plants that sprout from roots (or root crowns) when the tops are killed.

Railing and dragging equipment are not to be used on any sprouting shrub species except in areas being treated primarily to improve wildlife habitat.

Use of this method is limited primarily to stands of mature big sagebrush having an adequate understory of native grasses and forbs. This method of brush management is not recommended if the site is to be seeded following treatment.

Time of operation is after brush has become dry and brittle but before brush has matured seed. Timing will vary with seasonal conditions and elevations.

3. Chaining:

Species: big sagebrush, Utah and Western juniper, singleleaf pinyon, black greasewood

Acceptable equipment: Ely Chain, Dixie Sager, cabling

Chaining is accomplished by dragging an anchor chain in a *U*-shape, half-circle, or *J*-shape behind two crawler tractors traveling in a parallel direction. A chain length of 200 to 500-feet with individual links weighing 75 to 150-pounds each is recommended. Heavier links stay on the ground better and are more effective on young trees and shrubs. The chain is attached to each tractor using a swivel joint to allow for tumbling and turning of chain. Chains are drug in a loose pattern to maximize ground contact. A chain length to swath width ratio of 2:1 to 3:1 is most effective. Higher traveling speeds produce more whip action on the chain and result in higher target species mortality.

The Ely chain is a modified conventional anchor chain where short lengths of railroad iron are welded across each link. An Ely chain will uproot large shrubs and trees as the welded cross-rail catches the base of a plant. The heavy chain then rolls over the uprooted plants crushing and breaking the branches. An Ely

chain also loosens the surface soil and creates an excellent seedbed for broadcast planting. Refer to the publication The Ely Chain (Cain, 1971) for more information on uses, construction, and operation of an Ely chain. In lieu of the Ely Chain, the Dixie Sager (link modification) and cabling are additional options available to accomplish similar objectives.

Chaining operations can be used on land that is too rough, steep, or rocky for other equipment.

Re-vegetation should be considered if there is less than 25 percent composition (by-weight), in total, of desired understory species present in the plant community prior to treatment.

Chaining shall be accomplished on the contour wherever possible. Chaining on the contour reduces power requirements for equipment and soil-disturbance furrows and brush and/or tree windrows are left on the contour. Debris piles oriented across slope interrupt overland flow and act as sediment traps.

4. Cutting

Species: Utah and western juniper, and singleleaf pinyon, tamarisk, Russian olive, and nonsprouters

Acceptable equipment: Chain saws, bow saws, axes or other appropriate hand tools, will be utilized. Hydraulic shearing blades and saws, hand grubbing

The cutting and disposal of individual plants is adapted to sites supporting a mix of woody species and only certain species are targeted for removal (or retention). This method is also applied to sites where a reduced number of target species is desired, especially trees such as juniper and singleleaf pinyon.

The number, size, quality, and species to be saved should be determined before cutting begins. If appropriate, individual plants (trees) to be saved should be marked to prevent unnecessary delay in selection by cutters.

Downed trees should be salvaged for fuelwood, sawlogs, poles, posts, or other use. Tree tops and limbs that remain following salvage should be lopped and scattered, or piled and burned, depending on the amount of slash produced. Slash burning will be done in openings. Slash may be piled and left for a time to provide wildlife habitat if specified in the plan. Burning of brush/slash piles will require a Prescribed Burn Plan in accordance with conservation practice PRESCRIBED BURNING (Code 338) specifications.

Stumps will be as cut as low to the ground surface as possible with equipment being used.

5. Beating and Mowing

Species: big sagebrush, snakeweed

Acceptable equipment: Flail-type rotary machines (rotobeater), rotary mowers (brush hog), drum aerators, roller chopper, circular saw-type equipment or sickle mowers can be used. Shredding or masticating equipment such as the Bull Hog or Hydro-Ax can also be used.

Equipment should be set to operate 4-inches (\pm 2-inches) above the ground level. All equipment should meet OSHA standards for operator protection.

Beating or mowing equipment is not to be used on any sprouting shrub species except in areas being treated primarily to rejuvenate browse plants for improved wildlife habitat.

This method is well suited to areas supporting stands of mature big sagebrush (and other non-sprouting shrub species) having an adequate understory of desirable herbaceous species that will respond to a reduction in shrub competition.

Operations are limited to stone-free areas on level to gently sloping landscapes.

Revegetation should be planned if there is less than 25 percent composition (by-weight), in total, of desired understory species present in the plant community prior to treatment.

6. Brush Raking

Species: big sagebrush, rabbitbrush, and manzanita.

Acceptable equipment: bulldozer with a brush rake attachment is used.

Rakes vary from front-mounted to dump rakes that are towed. Brush rakes shall penetrate deep enough to pull brush roots out of the ground.

Debris shall be pushed into windrows on the contour and allowed time to dry. Burn debris when dry and when weather conditions are favorable. Spread soil that has accumulated with windrowing following burning of dried brush. Burning of brush piles and windrows will require a Prescribed Burn Plan in accordance with conservation practice PRESCRIBED BURNING (Code 338) specifications.

Revegetation is recommended where 50 percent or more of the soil surface is disturbed or when there is less than 25 percent composition (by-weight), in total, of desired understory species present in the plant community prior to treatment.

7. Pushing

Species: juniper, singleleaf pinyon, Russian olive, and tree-type shrubs with large diameter main stems.

Acceptable equipment: Bulldozer with blade, front-end brush-rake, or grubber is used.

Push over trees when the soils are moist (not wet).

Uprooted trees may be left in place, pushed into piles, or arranged in windrows. Piles and windrows may be burned completely or selectively. Burning of brush piles and windrows will require a Prescribed Burn Plan in accordance with conservation practice PRESCRIBED BURNING (Code 338) specifications. Piles left intact provide wildlife cover.

Revegetation is recommended where 50 percent or more of the soil surface is disturbed or when there is less than 25 percent composition (by-weight), in total, of desired understory species present in the plant community prior to treatment.

B. CHEMICAL TREATMENT

NRCS will not develop biological or chemical treatment recommendations except for biological control utilizing grazing animals. NRCS may provide clients with acceptable biological and/or chemical references.

In accordance with NRCS policy, NRCS personnel are not authorized to provide recommendations for herbicide use. Landowners should contact local Cooperative Extension Service, chemical company representative or an agricultural consultant for specific recommendations. NRCS personnel will evaluate environmental risk associated with herbicide recommendations relative to treatment site conditions and potential for herbicide to result in significant environmental impacts.

Land users and applicators using chemical herbicides are cautioned as follows:

Read the entire container/product label – Follow all instructions and heed all precautions on the label.

Landowners and applicators should be aware of and adhere to the provisions of local, county, state or federal laws and regulations concerning the use of agricultural chemicals.

Required conformance with permits of all local, state and federal regulations for use of chemicals shall be the responsibility of the landowner. Permits for use of chemicals will

specify legally required setbacks from water courses, ponds, residences, etc.

Specifications for the kind of chemical, methods, and time of application will be in accordance with the herbicide label and in accordance with the latest:

- University of Nevada Cooperative Extension Service - Weed Control Recommendations;
- University of Nevada Cooperative Extension Service Educational Bulletin-05-02 "Fighting Invasive Weeds-A Northeastern Nevada Landowner's Guide to Healthy Landscapes";
- Pacific Northwest Weed Control Handbook; and/or,
- Montana-Utah-Wyoming Weed Management Handbook.

Guidelines:

- Chemical treatments provide a means of killing certain species (*i.e.*, crown-sprouters) that cannot be efficiently controlled by other methods. At times chemical treatments can be used in conjunction with mechanical methods.
- Herbicides can be used in terrain or rocky areas unsuitable for mechanical equipment.
- When water is used as a carrier, commercial wetting agents (surfactant/adjuvant) shall be used according to manufacturers' recommendation and herbicide label
- Herbicides used for brush management will never be applied over live water, including flowing springs. It is the responsibility of the landowner to ensure that herbicide applications are in full compliance with this requirement.

C. BIOLOGICAL TREATMENT

Grazing with alternatives kinds of livestock, particularly browsers such as sheep or goats during critical growing stages of target plants can be effective control for certain species. The hoof action associated with winter-feeding of livestock may also effectively reduce some brush species. Specifications for biological treatment will be developed based on the individual problems of the area, and available research data. Specific treatments will address the kind of grazing/browsing animal to be used; timing, duration and intensity of grazing or browsing; desired degree of grazing or browsing use for effective control of target species; and maximum allowable degree of use on desirable

non-target species. Management of brush by application of controlled livestock grazing will be in accordance with conservation practice PRESCRIBED GRAZING (Code 528) standards and specifications.

D. PRESCRIBED BURNING

Management of woody species by application of controlled burning will be in accordance with conservation practice PRESCRIBED BURNING (Code 338) specifications.

V. BASIS OF ACCEPTANCE/MONITORING

Collecting post-treatment data is necessary to determine efficiency (% cover removed) and to determine if objectives have been met. Measure canopy cover before and after treatment using the continuous line-point method documented on the NV-CPA-314. In addition to the line intercept method other methods may be used. For other methods refer to: Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems USDA-ARS Jornada Experimental Range, 2005; the National Range and Pasture Handbook USDA-NRCS, 2003; and Sampling Vegetation Attributes USDI-BLM, 1996.

VI. OPERATION AND MAINTENANCE

Brush management treatment areas that are not seeded require a *minimum* period of deferment for at least two growing seasons from use by domestic livestock. The period of deferment is dependent upon management objectives and the pretreatment density and vigor of desirable plants expected to benefit from application of the brush management practice.

Full benefit to established species released from competition with woody plants is usually realized after the second growing season following treatment (assuming "normal" growing conditions).

Drought following treatment, low vigor of desirable grasses, invasion of the treated area by undesirable plants, and/or other abnormal conditions may make it desirable to extend the deferment beyond the above requirements. If any of these conditions exist, the NRCS conservationist will inform the cooperator of required extended additional deferment periods.

Treated areas should be inspected periodically and determination made of "spots" where additional treatment is necessary.

REFERENCES

- Cain, Don. 1971. The Ely Chain. USDI-BLM, Ely, Nevada.
- Connolly et al. 2000. Guidelines for Management of Sage Grouse Populations and Habitats. Wildlife Society Bulletin 28:967-985.
- Jordan, G. L. 1981. Range Seeding and Brush Management on Arizona Rangelands. Cooperative Extension Service, Agricultural Experiment Station Publication T81121, University of Arizona, Tucson, AZ.
- Montana, Utah, and Wyoming Cooperative Extension Service. 1995. Weed Management Handbook. Montana State University, Bozeman, MT; Utah State University, Logan, UT; and University of Wyoming, Laramie, WY.
- Nevada Cooperative Extension Service. 1976. Weed Control Recommendations for Rangeland. University of Nevada, Reno, NV.
- Nevada Cooperative Extension Service. 2005. Fighting Invasive Weeds- A Northeastern Nevada Landowners' Guide to Healthy Landscapes. Educational Bulletin-05-02. University of Nevada, Reno, NV.
- Oregon, Idaho, and Washington Cooperative Extension Service. 1995. Pacific Northwest Weed Control Handbook. Oregon State University, Corvallis, OR. and Washington State University, Pullman, WA.
- Valentine, J.F. 1989. Range Development and Improvements. Third Edition. Academic Press San Diego, CA.