Natural Resources Conservation Service
CONSERVATION PRACTICE STANDARD
NEW MEXICO

BRUSH MANAGEMENT

Code 314

(Ac)

DEFINITION

The removal or control of woody (non-herbaceous or succulent) plants including those that are invasive and noxious.

PURPOSE

- Create the desired plant community consistent with the ecological site or a desired state within the site description.
- Restore or release desired vegetative cover to protect soils, control erosion, reduce sediment, improve water quality, or enhance hydrology.
- Maintain, modify, or enhance fish and wildlife habitat.
- Improve forage accessibility, quality, and quantity for livestock and wildlife.
- Manage fuel loads to achieve desired conditions.
- Pervasive plant species are controlled to a desired level of treatment that will ultimately contribute to creation or maintenance of an ecological site description “steady state” addressing the need for forage, wildlife habitat, and/or water quality.

CONDITIONS WHERE PRACTICE APPLIES

On all lands, except active cropland where the removal, reduction, or manipulation of woody (non-herbaceous or succulent) plants is desired.

This practice does not apply to removal of woody vegetation by prescribed fire; use Prescribed Burning (338) or removal of woody vegetation to facilitate a land-use change; use Land Clearing (460).

For management of herbaceous species use Herbaceous Weed Control (315).

CRITERIA

General Criteria Applicable to All Purposes

Brush management will be designed to achieve the desired plant community based on species composition, structure, density, and canopy (or foliar) cover or height.

Brush management will be applied in a manner to achieve the desired control of the target woody species and protection of desired species. This will be accomplished by mechanical, chemical, burning, or biological methods, either alone or in combination.

When prescribed burning is used as a method, use Prescribed Burning (338).

When the intent is to manage trees for silviculture purposes, use Forest Stand Improvement (666) and Woody Residue Treatment (384).

When objectives include recreation area improvement, refer to specifications for Recreation Area Improvement (562).

NRCS will not develop biological or chemical treatment recommendations except for biological control utilizing grazing animals. In such cases, use Prescribed Grazing (528). NRCS may provide clients with acceptable biological and/or chemical control references. New Mexico State University 597 Circular will be used as the chemical reference.
http://aces.nmsu.edu/pubs/_circulars/CR597/

In cases where there is insufficient understory vegetation to provide a seed source that will result in the desired plant community use Range Planting (550) or Forage and Biomass Planting (512). Use Critical Area Planting (342) where significant soil disturbance or landscape shaping is needed.

In areas of mixed stand of brush, priority of treatment will be for the target species or group of species where predicted treatment effects will provide the most benefit to meet the producer objective.

Treatment methods will be selected to achieve desired target of the undesirable species with the least harm to non-target species.

Follow-up treatments such as spot treatment of individual plants or areas needing re-treatment due to regrowth, re-sprouting, or re-occurrence may be necessary to accomplish objectives on pervasive species. Retreatment of one species on the same area will require approval through the State Rangeland Management Specialist. Other treatments options such as a split method with more than one control method for the same species or control for two or more species under certain conditions may be utilized in cases such as when the resource concern is not met with treatment of only one species.

Noxious and Invasive species are appropriate for treatment at any level of cover or density. However, suppression of noxious and invasive brush on noncropland must facilitate implementation of another NRCS-approved conservation practice when financial assistance through the Environmental Quality Incentives Program is applied.

Where treatment of the target species would likely open the area for other non-native or invasive plants that have the potential to take control of the site, management of these species should also be considered in the plan. Or where post treatment soil erosion is expected to be severe; mitigating practices must be installed.

Species that are considered noxious and invasive in New Mexico are found on the New Mexico Department of Agriculture Noxious Weed List. http://www.nmda.nmsu.edu/apr/noxious-weed-information/

Brush management will be planned and applied in a manner that will not adversely affect threatened or endangered species or their habitats. Alternatives will be developed that avoid or minimize adverse effects on State Species of Concern and their habitats. Refer to Wildlife Upland Habitat Management (645) for planning considerations.

Evaluation of soil erosion potential, local weather conditions, local environmental conditions and likelihood of seeding success should be considered when choosing a method of management that causes soil disturbance.

Consideration will be given to the effects brush management will have on water quality. Herbicide labels will be followed for open water and water table restrictions. Chemical brush management will not be applied on sites where water quality will be negatively impacted.

Reseeding of native species will be necessary where less than 20% similarity index to the ESD plant community is present or where less than 5% basal cover of desired species remnants are present pre-treatment unless experience has shown that brush treatments in that environment will result in natural release of sufficient desired herbaceous species in a reasonable time.

Seeding practices should be applied in a timely manner to help prevent invasion of weeds, re-invasion of the initial target species and other brush species from release of seed stored in the soil bank.

For grazing lands, deferment of grazing shall be applied after planned treatment to facilitate maximum treatment success.

Prescribed Grazing (528) and Use Exclusion (472) can be applied to help ensure desired response from treatments. (See Practice Standards & Specifications 528 and/or 472 for grazing management requirements after Brush Management).

Grazed range treated with brush management will include the following deferment periods:

1. Deferment will be for the remainder of the growing season from the time of application and/or control. If application and/or control is done after

August 15, the area will also receive a 90-day spring growing season rest the next year.

2. A high intensity (Short Duration or Cell) grazing system can be used in place of deferment criteria in this standard. The released forage species are to be managed for improved vigor and an upward range trend.

3. Chemical Control:

a. The area will be deferred for the time shown on approved label of the herbicide used, or longer as required by this standard.

b. Where chemical is applied by individual plant treatment after July 1, the area will be deferred the remainder of the growing season and deferred again 90 consecutive days during the growing season the next year.

c. When slow-acting, soil applied herbicides are used, the area will be deferred according to the label and from the time of the first visual signs of chemical activity through the remainder of the first growing season. Deferment during the second growing season will be based on the physiological needs of the plant community. It is highly possible that deferment will be needed the second growing season to allow desirable vegetation to respond to reduced competition from target vegetation.

Brush Management will not be applied where:

1. The treatment has not been designed prior to implementing the practice.

2. Where the benefits are disproportionate with the costs and the objectives of the landowner and NRCS.

3. Where Pinyon or Juniper will be removed from lands classified as Pinyon-Juniper Forestland or Woodlands that match the definition of "original Pinyon – Juniper Site" as described on page 8 of woodland Technical Note No. 1 (revised April 2, 1981. RE: Pinyon-Juniper Management.)

https://efotg.sc.egov.usda.gov/references/public/NM/wood1_transmittal_document_revisedApril1981.pdf

For help Classifying Juniper and Pinyon Communities from invaded rangeland, use the key found in Forestry-Woodland Technical note 51: *Inventorying, Classifying, and Correlating Juniper and Pinyon Communities-To Soils in Western United States.*
https://efotg.sc.egov.usda.gov/references/public/NM/Forestry-WoodlandTechNote51.pdf

4. When there will be long term negative impact to environmental, cultural or landscape resources.

5. Where grazing management is inadequate on non-brush areas of the operating unit and a restoration grazing plan is not developed and applied.

Criteria Relating to Infestation Levels

Infestation is based on the occurrence of the dominant species and/or the associated species. Generally, heavy infestation indicates infestation levels that suppress herbaceous plant cover and hinder the movement of larger classes of livestock. Medium infestation levels generally are significant to limit herbaceous plant cover, and light infestation levels indicate brush species are present above the level found in the ESD but not sufficient to limit herbaceous cover.

Criteria will be determined using the following method(s) and Table 1 of the Specification and will be documented on the Implementation Requirements (Job sheet):

To determine canopy cover of shrub and tree species use; New Mexico Range Technical Note No. 28 (Rev. September 1970), method to determine canopy cover using the canopy cover intercept method. Please use this method where canopy cover intercept is listed as the inventory method in table 1.
http://www.nm.nrcs.usda.gov/technical/tech-notes/range/range28.pdf

To determine plants per acre of shrub species: Three 1/10 acre plots (each plot to measure 6.05' x 720' or 12.1' x 360 or 66' x 66' or 37.25 feet in radius circle) placed in an area representative of the proposed treatment area is acceptable where the average of the three is used. See "Belt Transect for measuring perennial invasive plants and woody species" portion of the Agricultural Research Service, Jornada Experimental Range - Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems
http://jornada.nmsu.edu/monit-assess/manuals/monitoring

To determine density of tree species: The National Forestry Handbook, 2004 describes the use of the zig zag transect for determining tree density. This method is only to be used on Juniper or mixed pinon/juniper/ or mixed p-j/ponderosa stands.

http://www2.ca.uky.edu/Forestry/FOR250/NationalForestryHandbook.pdf

The average tree spacing is found by dividing the total of distances from tree to tree in the zigzag transect by the number of trees sampled in the same transect. The number of trees per acre = 43560/Avg. tree spacing squared. Only enough data needs to be gathered in the zigzag transect to yield the average tree spacing for a representative stand sample area. Minimum of 20 trees per transect and at least 1 line per density class in the specification.

Alternative method to determine density of tree species 1/10 acre plots (each plot to measure 66' x 66' or 37.25 feet in radius circle) Minimum to characterize the treatment unit is 1 plot placed in an area representative of each density class in the specification.

Criteria Relating to Degree of Reduction (Percent Kill)

The degree of control or removal of the target specie(s) from the plant community will be determined by, and designed to achieve the intended purpose(s) for the planned brush management. The degree of reduction will depend upon the method of treatment selected, the objectives of the cooperator, and the environmental consequences. The Ecological Site Description (ESD) should be used to set a target level of brush reduction.

A general guideline is to expect 80% or more of the target species canopy or density to be killed within the treatment area at the conclusion of all treatments. In some cases other resource considerations (such as wildlife habitat needs or socio-economic concerns) may dictate a lesser percentage of density reduction. All such decisions must be recorded in the Brush Management Implementation Requirements (job sheet).

The percent of target species reduction can be calculated by conducting a series of transects in the pretreatment state and comparing that to the post treatment numbers in the same transect lines. See table 1 of the Specification for the proper transect method for each target species. The applied brush management will be within ten percent of the planned degree of control.

Additional Criteria for Chemical Pesticide Use:

The Cooperator must be supplied a copy of the specification including the required environmental conditions for effective product application and the cooperator will be advised on:

1. Federal, state and county laws and regulations governing the use of herbicides and labeling. The uses for which the herbicide has been registered are included in the information provided on the label of the commercial product. By reading the label, determine the proper uses for which the product is intended. Herbicides approved for specified uses in New Mexico are listed in the, **Chemical Weed and Brush Control for New Mexico Rangelands, NMSU Cooperative Extension Service • Circular 597**. http://aces.nmsu.edu/pubs/_circulars/CR597/

Additional information on treatment for specific species can be found in the **Brush and Weed Control on New Mexico Ranges, NMSU Cooperative Extension Publication 806 and the specification for this standard.** http://aces.nmsu.edu/pubs/_b/B806/welcome.html

Refer to the label on the commercial product for detailed information concerning dosage application and precautions. Certain precautions may be noted in the publication that are not included on the label but are applicable to local conditions in New Mexico.

2. It is legal to use registered mixtures of herbicides; however, only a few mixtures of herbicides are registered.

3. Proper certification to apply the herbicide.

4. Note that label data on herbicides are maximal values and also represents manufacturers guaranteed product efficacy rates. Lower marginal rates except as specifically mentioned in this standard and specifications must be approved by the ASTC/Technical Services.

5. Environmental Risk Analysis (WIN-PST) and interpretation of analysis and identification of appropriate mitigation techniques must be integrated into the conservation plan and discussed with the client.

Additional Criteria for Creating the Desired Plant Community Consistent with the Ecological Site or a Desired State within the Site Description

Use applicable Ecological Site Description (ESD) state and transition models to develop specifications that are ecologically sound and defensible. Treatments must be congruent with dynamics of the ecological site(s) and keyed to state and plant community phases that have the potential and capability to support the desired plant community. If an ESD is not available, base specifications on the best approximation of the desired plant community composition, structure, and function to support resilience.

Additional treatments are planned and will be applied to achieve effective control of pervasive plant species through reapplication. Retreatment of one species on the same area will require approval through the State Rangeland Management Specialist.

Brush management on rangelands shall be planned in a way as to not remove more native woody and succulent species than what is listed in the desired state and transition plant community phase of the ESD for the site.

Additional Criteria for Restoring or Releasing Desired Vegetative Cover to Protect Soils, Control Erosion, Reduce Sediment, Improve Water Quality or Enhance Hydrology

Choose a method of control that results in the least amount of soil disturbance if soil erosion potential is high and revegetation is slow or uncertain or may leave the site vulnerable to long-term exposure to soil loss.

In conjunction with other conservation practices, the number, sequence, and timing of soil-disturbing operations must be managed to maintain soil loss within acceptable levels using approved erosion prediction technology.

Additional Criteria to Maintain, Modify or Enhance Fish and Wildlife Habitat

Brush Management will be planned and applied in a manner to meet the habitat requirements for cover (i.e. thermal, nesting), food or space (connectivity) of the wildlife species or suites of species of concern by an approved habitat evaluation procedure. Evaluations may require consultation with a biologist.

These species and associated conservation measures will be listed on the implementation requirements. Any special patterns and/or reduced rates of application used to improve wildlife habitat requirements will be recorded on the Implementation Requirement sheet (Jobsheet).

The species of concern for NM NRCS are called *Species of Greatest Conservation Need* within the New Mexico Department of Game and Fish (NMDGF) State Wildlife Action Plan. A list can be downloaded by querying the NMDGF database system, Biota Information System of New Mexico (BISON-M; www.bison-m.org).

Conduct treatments during periods of the year that accommodate reproduction and other life-cycle requirements of target wildlife and pollinator species, and in accordance with specifications developed for Wetland Wildlife Habitat Management (644) and Upland Wildlife Habitat Management (645).

Reduced chemical rate applications may be used under this purpose. (An example of this would be ½ pound per acre of A.I. Tebuthiuron applied under the supplemental label instructions versus what is currently considered the full rate of 3/4 pound per acre or more).

Planners are to be aware of the soil and weather variables that will constrain the effectiveness of this low rate strategy and convey them to clients considering this alternative. Clients using reduced rates are potentially accepting lower management rates than the standard.

Consideration should be made to cumulative effects and spatial relationship impacts to wildlife food supplies, space and cover availability when planning the method and amount of brush management. For instance, many chemical treatments may cause short term suppression of the forb community.

Consult the state biologist to assess impacts to species when planning block treatments. In general, treatments that create a mosaic are more desirable.

Additional Criteria for Treatments in Listed Species Habitat:

NRCS will make an assessment to determine whether a brush management project within a listed species critical habitat will adversely affect any protected species or their habitat. If the project area is in known, occupied, or suitable habitat of any protected species or their designated critical habitat then informal consultation with NRCS State Biologist is required. The NRCS State Biologist will determine if additional consultation with the USFWS is appropriate.

Official lists of Threatened and Endangered Species, and their designated critical habitats are located at:IPaC: Home. Designated critical habitat GIS data is located on each field office server under F: geodata/endangered_habitat.

Salt cedar and Russian olive removal must be by hand cutting, cut-stump spray treatment, or grubbing in listed fish or plant species habitat. The use of large equipment is not allowed except outside of the active floodplain. Heavy equipment use would require additional consultation.

Herbicide treatments in listed species habitat must follow the guidelines within the FWS document: "Recommended Pesticide Application Protection Measures - FWS 2007.pdf"

Conservation Measures (CMs) - Southwest willow flycatcher riparian habitat (SWFL)

The FWS Biological Opinion must be used when identifying Conservation Measures for Brush Management within Southwest Willow flycatcher Riparian Habitat. The Biological Opinion can be found at: https://efotg.sc.egov.usda.gov/references/public/NM/2015-F-0001_NRCS_WIFL_BO.pdf

If using this practice within the 100 year floodplain, then additional conservation measures apply. Refer to the Conservation Measures for All Conservation Practices within the 100 year Floodplain: https://efotg.sc.egov.usda.gov/references/public/NM/Biological_Opinion_WLFW_SWFL-Conserv_Measures.pdf

But the following is a key list specific to brush management identified in the document.

- *This practice will not be used in cases where habitat currently meets all minimum occupation requirements of SWFL (per the SWFL WHEG) and greater than 50% of nesting canopy cover consists of tamarisk*.
- Conservation plans using Brush Management will be designed to develop SWFL habitat of improved quality or that provides equivalent habitat and decreases the potential of wild fire due to tamarisk.
- Tamarisk in a nesting patch shall not be treated if a biologist (as designated by the State Biologist) determines that implementation of Brush Management will decrease SWFL viability in the patch for the following nesting season.
- Treated sites may be deferred from grazing for a period of time determined to be necessary to restore SWFL habitat based on pre and post site treatment conditions.
- This practice is not to be used for land use change.
- Slash treatment will occur outside of the 100-year floodplain when it is not in seed. If it has set seed, contact the State Biologist for further guidance.
- If soil is disturbed, use site specific reclamation using SWFL WHEG, Stream Visual Assessment Protocol-2 and/or riparian Ecological Site Description with consideration of SWFL habitat needs.

Conservation Measure (CMs) – Lesser Prairie Chicken Habitat (LPC)

The FWS Biological Opinion must be used when identifying Conservation Measures for Brush Management within Lesser Prairie Chicken Habitat. Biological Opinion can be found at: https://efotg.sc.egov.usda.gov/references/public/NM/LPCi_Biological_Opinion.pdf

Criteria for the application of brush management on shinnery oak is found in Biology Technical Note 53. https://efotg.sc.egov.usda.gov/references/public/NM/bio53_revision.pdf

NRCS shall coordinate with the New Mexico Department of Game & Fish (NMDGF) and confer with the State Technical Committees to identify appropriate restrictions on the placement, extent, configuration, and timing of this conservation practice standard and the area where these practice restrictions would apply so as to avoid or minimize adverse effects to the LPC and supporting habitat conditions.

- No treatment within 45 meters (150 feet) of Sand Hills ecological sites (i.e. dunes). See NM

FOTG Section II for detailed description of sand hills ecological sites.

- Design will be in irregular shapes (mosaics), designed to blend into the natural landscape. Treatment will not be in large blocks or strips.
- Within the area allowed to be treated; no more than 50 percent of an individual management unit (pasture) will be treated during any two year period. This will reduce the impact on forb production; reduce the loss of winter forage resources for the LPC, and minimize the risk and uncertainty to the species due to climatic factors.
- Limited herbicide application rate will be used as identified in the NM Biology Technical Note No. 53. Full control is not authorized within LPC or Dunes Sagebrush Lizard (DSL habitat ranges.
- This practice standard will be designed to support other practices which will create the desired habitat conditions for the LPC as recommended by the NMDGF.
- Defer implementation of this conservation practice within 1/2 mile to known leks and nest sites until all breeding and nesting activities are completed, typically March 1 through July 15, or as modified by NMDGF or State Technical Committee recommendations. Refer to the SGP CHAT: http://kars.ku.edu/geodata/maps/sgpchat/.
- Use CHAT data to determine project proximity to known leks and nest sites (Crucial Habitat Index of 1 or 2). Known leks: are leks that are occupied or have been recorded as active at least once within the previous five years.
- Evaluate the site's potential for soil erosion and invasion by undesirable plants during practice planning and design.
- The practice will be designed to minimize or avoid unintentional damage to non-target plants.
- The implementation plan shall *clearly identify* any special resources that need to be avoided; such as riparian areas, wetlands/playas, leks, or habitat of other at-risk species.
- Large brush (>5 ft. tall) will be felled unless other considerations necessitate leaving them standing.
- Woody slash shall be treated if significant buildup of fuels occurs. Slash piles shall be burned when wildfire risk is low (usually when soils are frozen or saturated). Follow state forestry laws, when applicable, for treating slash to minimize wildfire risk.

Additional criteria when working within Dunes Sagebrush Lizard Habitat (DSL).

No treatment within 500 meters (1,640 feet) of any sand dunes. These areas will be determined at a landscape scale rather than a dune-by-dune scale and will also delineate corridors for movement between dune complexes. Dispersal corridors between dunes should be provided within the dunes sagebrush lizard habitat. Do not treat the flats between occupied dunes and dunes suitable to be occupied that are separated by less than 2,000 meters (1.25 miles); to create a corridor at least 500 meters (1,640 feet) wide.

Additional Criteria to Improve Forage Accessibility, Quality and Quantity for Livestock and Wildlife

Timing and sequence of brush management must be planned in coordination with specifications developed for Prescribed Grazing (528).

The grazing management plan will include provisions that account for periods of forage unavailability in pastures while those areas recover from brush management treatments.

Additional Criteria for Control of Pervasive Plant Species to a Desired Level of Treatment That Will Ultimately Contribute to Creation or Maintenance of an Ecological Site Description "Steady State" Addressing the Need for Forage, Wildlife Habitat, and/or Water Quality.

Additional treatments are planned and will be applied to achieve effective control of pervasive plant species through reapplication. Species that meet "pervasive" criteria are included in Range Technical note 114: https://efotg.sc.egov.usda.gov/references/public/NM/RangeTechNote114.pdf
Consultation with the State Rangeland Management Specialist is required for reoccurring treatments when a NRCS financial program is being utilized on the same footprint of land.

Additional Criteria to Manage Fuel Loads to Achieve Desired Conditions

Control undesirable woody species in a manner that creates the desired plant community, including the desired fuel load, to reduce the risk of wildfire, and facilitate the future application of Prescribed Fire (338).

Fire can be used effectively to reduce or remove species such as sagebrush or juniper. When root-sprouting species such as oak, rabbitbrush,

horsebrush or salt cedar are burned, other methods like herbicide application will be necessary for effective control.

Use Prescribed Fire (338), Firebreak (394) and Fuel Break (383) practices for criteria and considerations that will aid in designing a management strategy in reducing wildfire hazards.

Additional Criteria to Manage Brush Species in Organic Systems

If this practice has the potential to effect land managed under the USDA standards for Organic production, then treatment alternatives must be included that meet standards for the National Organic Program (NOP): http://www.ams.usda.gov/AMSv1.0/nop

Each Producer is responsible for selecting and implementing an alternative that that meets management objectives, including adherence to NOP standards and/or other guidelines.

CONSIDERATIONS

Consider using Integrated Pest Management (595) in support of brush management.

Preserving the natural beauty of the treatment area should be an integral part of the planning process. The treatment area will be designed to blend with the untreated area wherever possible.

The timing and sequence of brush management in a pasture and/or the entire operating unit should be planned to ensure any required grazing management will be obtained.

Consider the appropriate time period for treatment. Some brush management activities can be effective when applied within a single year; others may require multiple years of treatment(s) to achieve desired objectives.

Consider impacts and consequences to obligate species (species dependent on the target woody species) when significant changes are planned to existing and adjacent plant communities.

State-issued licenses may be required when using chemical pesticide treatments.

For air quality purposes, consider using chemical methods of brush management that minimize chemical drift and excessive chemical usage, and consider mechanical methods of brush management that minimize the entrainment of particulate matter.

The use of any wood products, such as fuel wood or posts, should be considered and addressed in the brush management plan.

PLANS AND SPECIFICATIONS

Plans and specifications for the treatment option(s) selected by the decision maker will be recorded for each field or management unit where brush management will be applied.

Prepare brush management plans and specifications that conform to all applicable federal, state, and local laws. These documents will contain the following data as a minimum:

1. Goals and objectives clearly stated.
2. Pre-treatment cover or density of the target plant(s) and the planned post-treatment cover or density and desired efficacy.
3. Maps, drawings, and/or narratives detailing or identifying areas to be treated, pattern of treatment (if applicable), and areas that will not be disturbed. Hazards affecting treatments are to be disclosed by the client to all contractors. These are to include power lines, underground utility, Meteorological Evaluation Towers-Wind Measurement (MET) towers, etc.
4. A monitoring plan that identifies what should be measured (including timing and frequency) and documents the changes in the plant community (compare with objectives) will be implemented.
5. Any mitigation planned for environmental, cultural, or landscape resources.
6. Prescription for deferment and or prescribed grazing.
7. Check-out procedure and certification of completion.
8. Follow up measures, if needed

For Mechanical Treatment Methods:
Plans and specifications will include items 1 through 8, above, plus the following:

- Types of equipment and any modifications necessary to enable the equipment to adequately complete the job.
- Dates of treatment to best effect control
- Operating instructions (if applicable)

• Techniques or procedures to be followed

For Chemical Treatment Methods: Plans and specifications will include items 1 through 8, above, plus the following:

• Acceptable chemical treatment references for containment and management or control of target species.
· Acceptable dates or plant growth stage at application to best effect control and suppress reinvasion
• Any special mitigation, timing considerations or other factors (such as soil texture and organic matter content) that must be considered to ensure the safest, most effective application of the herbicide

• Reference to product label instructions

• Herbicide name (Chemical name not trade name)

• Rate of application in Pounds of Active Ingredient per acre.

• Spray volume in gallons per acre.

• Mixing instructions (if applicable)

• Any special application techniques, timing considerations or other factors that must be considered to ensure the safest, most effective application of the herbicide. This will include soil and air temperature, plant phenology, and wind speed parameters where this information is critical to treatment effectiveness.

• Where an aerial applicator is used then GIS generated files of the planned treatment areas MUST be supplied to the client along with a map in pdf format. (NRCS may supply the files and map to the applicator with the client' permission) as well as GPS generated files of the completed treatment areas MUST be supplied to NRCS by the client or applicator.

• Application Monitoring and check-out procedure and certification of completion. It is mandatory that NRCS Field Office staff be supplied documentation that all chemical Brush Management operations are conducted according to these standards and specifications. Accordingly, on the ground monitoring of chemical brush treatments by qualified field office staff is required where chemical product labels prescribe specific environmental conditions that impact product efficacy such as wind speed, soil temperatures, plant phenology and air temperatures. Consult with New Mexico BLM where their treatment monitoring operations are in proximity to private operations. If on-site monitoring by NRCS or BLM staff cannot be accomplished then the cooperator and the chemical applicator can continue with the treatment and **assume all responsibility** for correctly applying the treatment and effectiveness and must supply all required treatment monitoring documentation to NRCS. Such documentation will be stored in the NRCS customer file. Clients always have the ability to suspend treatments until all parties are satisfied that all criteria and considerations can be met.

• **Ultimately the Producer is responsible for the proper implementation of the conservation practice.** The cooperator contracts with the applicator and has the responsibility to ensure that the applicator applies these specifications accordingly. Any deviations recommended and/or implemented by the cooperator and/or applicator, which are outside the prescribed environmental conditions that impact product efficacy such as wind speed, soil temperatures, plant phenology, and air temperatures, are the sole responsibility of the cooperator. Deviations, which may result in less than agreed to levels of control, can result in this practice not being certified as completed.

• It is required that all aerial chemical applicators conform to the NAAA Operation SAFE configuration that was produced for that airframe number. Where applicators do not have NAAA Operation SAFE data or the equipment is not configured in the same manner as was tested and certified on the SAFE card then the cooperator and the chemical applicator can continue with the treatment and assume all responsibility for correctly applying the treatment and effectiveness and must supply all required treatment monitoring documentation to NRCS. Such documentation will be stored in the NRCS customer file.

• Aerial Chemical Applicators using an Electrostatic Aerial Spray System will rigorously conform to the supplemental chemical label instructions and rates and weather parameter constraints that are contained on the label. Requirements for daily maintenance and cleaning will also be adhered too.

• Documentation of the use of environmental risk analysis tools (such as WIN-PST Soil Pesticide Interaction Loss Potential and Hazard Rating Report) in formulating alternatives with the client.

Any selected alternative that will potentially have a negative impact on water resources. (e.g., WIN-PST "Extra High", "High" or "Intermediate" soil/pesticide loss or human risk ratings). Must have an appropriate set of mitigation techniques planned and implemented to address risks to humans and non-target plants and animals.

Any selected alternative that models in WIN-PST with an “Extra High” rating for an identified water resource concern requires the planning and implementation of all possible mitigation in addition to applicable Integrated Pest Management (IPM) that optimizes the use of this pesticide to the maximum extent possible.

Other treatment options will be considered if chemical treatment will negatively impact water quality.

For Biological Treatment Methods: Plans and specifications will include items 1 through 8, above, plus the following:

• Acceptable biological treatment references for containment and management or control of target species

• Kind of grazing animal to be used, if applicable

• Timing, frequency, duration and intensity of grazing or browsing

• Desired degree of grazing or browsing use for effective control of target species

• Maximum allowable degree of use on desirable non-target species

• Special mitigation, precautions, or requirements associated with the selected treatment(s) including using insects or plants as management agents.

• See Prescribed Grazing (528) Specification titled:”

Supplement 1-Brush and Weed Pest Management with Goats” for details on Brush Management with Goats.

OPERATION AND MAINTENANCE

The expected lifespan of this practice is 10 years. With good maintenance, brush management applied can last longer than this lifespan.

Operation

Brush management practices must be applied using approved materials and procedures. Operations will comply with all local, State, and Federal laws and ordinances.

Success of the practice shall be determined by evaluating post-treatment regrowth of target species after sufficient time has passed to monitor the situation and gather reliable data. Length of evaluation periods will depend on the woody species being monitored, proximity of propagules (seeds, branches, and roots) to the site, transport mode of seeds (wind or animals), and methods and materials used.

For Chemical applications:

The chemical operator and producer will develop a safety plan for individuals exposed to chemicals, including telephone numbers and addresses of emergency treatment centers and the telephone number for the nearest poison control center. The National Pesticide Information Center (NPIC) telephone number in Corvallis, Oregon, may also be given for nonemergency information: **1-800-858-7384,** Monday to Friday, 6:30 a.m. to 4:30 p.m. Pacific Time. The national Chemical Transportation Emergency Center (CHEMTRAC) telephone number is **1-800-424-9300.**

- Follow label requirements for mixing/loading setbacks from wells, intermittent streams and rivers, natural or impounded ponds and lakes, and reservoirs.
- Post signs, according to label directions and/or Federal, State, Tribal, and local laws, around fields that have been treated. Follow restricted entry intervals.
- Dispose of herbicides and herbicide containers in accordance with label directions and adhere to Federal, State, Tribal, and local regulations.
- Read and follow label directions and maintain appropriate Safety Data Sheets (SDS). SDS and pesticide labels may be accessed on the Internet at: http://www.greenbook.net/ or http://www.cdms.net/Label-Database
- Calibrate application equipment according to recommendations before each seasonal use and with each major chemical and site change.
- Replace worn nozzle tips, cracked hoses, and faulty gauges on spray equipment.
- Maintain records of brush/shrub control for at least 2 years. Herbicide application records shall be in accordance with USDA Agricultural Marketing Service’s Pesticide Recordkeeping Program and State-specific requirements.

Maintenance

Following initial application, some regrowth, re-sprouting, or reoccurrence of brush may be expected. Spot treatment of individual plants or areas needing retreatment should be completed as needed while woody vegetation is small and most vulnerable to desired treatment procedures.

Review and update the plan periodically in order to:

- Incorporate new Integrated Pest Management (IPM) technology.
- Respond to grazing management and complex plant population changes.
- Avoid the development of plant resistance to herbicide chemicals.

REFERENCES

Branson, F.A., G.F. Gifford, K.G. Renard, R.F Hadley, and E.H. Reid, ed. 1981. Rangeland Hydrology, 2nd ed., Society for Range Management, Colorado.

Briske, D.D. [ed]. 2011. Conservation Benefits of Rangeland Practices: Assessment, Recommendations, and Knowledge Gaps. U.S. Department of Agriculture, Natural Resources Conservation Service. 429 pages.

Heady, H.F. and D. Child, 1994. Rangeland Ecology and Management, Westview Press, Colorado.

Holechek, J.L., R.D. Pieper and C.H. Herbel. 2000. Range management principles and practices, 5th edition. Prentice Hall, New Jersey.

Krausman, P.R., ed. 1996. Rangeland Wildlife. Society for Range Management, Colorado.

Monsen, S.B., R. Stevens, and N.L. Shaw, comps. 2004. Restoring Western Ranges and Wildlands, Volume 1. Gen. Tech. Rep. RMRS-GTR-136-1, USDA, Forest Service, Fort Collins, Colorado.

U.S. Fish and Wildlife Service. 2007. Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service. U.S. Fish Wildlife. Serv., Austin, TX. 205pp.

United States Department of Agriculture, Natural Resources Conservation Service. 2003. National Range and Pasture Handbook. Washington, DC.

United States Department of Agriculture, Natural Resources Conservation Service. 2008. General Manual: Title 190 – Ecological Sciences: Part 404 – Pest Management. Washington, DC.

Valentine, J.R., 1989. Range Developments and Improvements, 3rd ed. Academic Press, Massachusetts.

Vavra, M., W.A. Laycock, R.D. Pieper, eds. 1994. Ecological Implications of Livestock Herbivory in the West. Society for Range Management, Colorado.