

# TECHNICAL NOTES

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## Planning Brush Management in California

This technical note is to be used by all NRCS planners and planning partners in California when planning Brush Management (CPS 314). It provides planning guidance for use in California.

### I. SCOPE

The management or removal of woody species to create a desired plant community consistent with the ecological site; restore or release desired vegetative cover to protect soils, control erosion, reduce sediment, improve water quality, or enhance hydrology; maintain or enhance wildlife habitat; improve forage accessibility, quality, and quantity for livestock; or manage fuel loads.

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.

#### Additional Scope when controlling **Juniper**:

The work shall consist of removing invading new-growth (less than 100 years old) juniper from sagebrush steppe and associated grassland and rangeland habitats consistent with the goals and objectives for this practice. This specification applies to those areas where understory sagebrush steppe plant species remain intact on site and where treatment of juniper is most likely to facilitate recovery of the desired habitat.

The objective for post-treatment cover levels of new-growth juniper is 0% except where associated with rock outcrops, lava spurs or areas specifically identified within the treatment plan.

### II. AREAS AND TIMING

The areas to be treated shall be shown on the plans and the methods used, target species, and timing of treatment are all shown on the Implementation Requirement sheet and supporting materials. Timing should be done to avoid nesting periods of birds utilizing the treatment area, usually March – August. Check with your local NRCS biologists for exact times as this could vary by elevation and year.

### III. GENERAL REQUIREMENTS

Brush management will be planned and applied as part of a Resource Management System (RMS). An RMS is a combination of conservation practices and resource management for the treatment of all identified resource concerns for soil, water, air, plants, and animals that meets or exceeds the quality criteria in the FOTG for resource sustainability. Brush Management plans shall not proceed to application until a review is made by the individual(s) having appropriate Job Approval Authority for management/vegetative practices.

Vegetation inventory will be conducted prior to planning this practice. This inventory, which is a part of the documentation needed for this practice, will be included in the conservation plan documents.

On rangeland areas, brush management treatments will be used to control, contain, or eradicate undesirable woody vegetation. Use Ecological Site Description (ESD) State and Transition model to determine if proposed actions are ecologically sound and defensible. If an ESD is not available, base design criteria on best approximation of native plant community composition, structure, and function. Treatments need to be compatible with dynamics of the ecological site(s) and targeted towards vegetative states 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; critical plant species that may occur within the project area, shrubland and grassland nesting birds, wetland or aquatic species that are associated with riparian areas, springs, seeps, or meadows associated with the treatment area. Consult with NRCS Area and State Biologists to identify possible wildlife habitat conflicts within treatment area. Avoid wetlands, riparian areas, springs or seeps.

If improving wildlife habitat is an objective of the client, the following practices are required to achieve maximum treatment effects:

- Upland Wildlife Habitat Management (645)
- Prescribed Grazing (528) if grazed by livestock

A cultural resources survey will be completed and resulting requirements incorporated into applications of this practice so no disturbance occurs to identified cultural resources. This cultural resource survey will occur prior to mechanical or manual treatment or other site disturbance from such activities including, but not limited to, the development of temporary access roads, burning of piled materials. These avoidance measures are also applicable to any associated post-treatment operations such as application of erosion control measures and temporary road deconstruction.

Cultural resource sites identified during a cultural resource survey or during other activities shall not be mechanically or manually treated except with concurrence from the NRCS State or Area Cultural Resources Specialist in consultation with the State Historic Preservation Officer.

Where livestock grazing occurs within the treatment area, released vegetation shall be allowed to recover prior to grazing. A grazing plan will be developed consistent with the goals of the conservation plan.

Treatment equipment shall not be used or allowed to travel across eroding features, riparian zones, springs, wetlands, or aspen stands. Unless specifically noted in the treatment plan and supporting maps, manual methods shall replace mechanical treatment where treatment is to occur within 25' of any perennial stream, seasonal stream, spring, or pond. Where tracked vehicles are used, turning in-place will be minimized to avoid unnecessary impacts to soils, non-target plants, and other resources.

The road/traffic plan shall be adhered to as consistent with minimizing impacts to cultural and natural resources. The road/traffic plan establishes the primary access routes for repeated vehicular traffic to, from, and across the treatment area. It will include identification of primary skid trails, landings, and burn pile locations in order to minimize disturbance throughout the treatment period. Populations of sensitive plant species and/or habitat as identified on the practice requirement sheet and/or supporting documentation will be avoided such that vehicle traffic, skidding, and other associated activities reduce potential impacts to identified resources.

Crossing with equipment through natural drainages on the landscape will be avoided. Where crossings are necessary and identified on the road/traffic plan, the number of passes will be minimized. Measures will be taken to avoid creating artificial drainage networks which increase the likelihood of erosion. Road berms, tire ruts and other artificial diversions associated with this treatment will be removed or modified in order to reduce hydrologic connectivity which can lead to gully development and impacts to off-site resources.

Unless otherwise noted on the practice requirement sheet, all trails/roads, burn pile locations, slash trails and sensitive resources will be flagged on site in advance of the treatment and in accordance with this specification, the practice requirement sheet, and supporting documentation, e.g., cultural resource survey, the road/traffic plan, botanical surveys and other site-specific requirements supporting the appropriate implementation of this practice.

Unless otherwise noted on the practice requirement sheet, areas of soil disturbance such as skid trails and temporary roads will be protected from erosion through the placement of juniper slash sufficient to reduce rate of overland water flow and raindrop impact. Where identified on the practice requirement sheet, seeding for erosion control will be consistent with Critical Area Planting (342) or Range Planting (550).

Prior to arriving at the treatment site, all equipment will be cleaned in order to reduce the introduction of noxious weed seed. Treatment equipment will be cleaned prior to departing the site and personnel transport vehicles will be inspected daily or as needed to prevent the spread of noxious species between sites.

Dry season operations will be done in a manner consistent with fire safety precautions and in compliance with local, state, and federal fire regulations. Activities performed under this practice will be achieved in a manner in consideration of fire and fuel loading issues regardless of the timing of the treatment. In most cases, it will be necessary to consult with fire authorities

prior to implementing the practice in order to assess relative risk to on-site and/or off-site as a result of fuel loading in the treatment area. Except where specifically consistent with an approved burn plan, the distribution of downed material will be in a manner which reduces the occurrence of ladder fuels and/or places on-site or off-site resources at undue risk of ignition.

Depending on site conditions, monitoring results and conservation plan goals, other practices which should be considered include:

- Forest Stand Improvement (666)
- Forest Trails and Landings (655)
- Obstruction Removal (500)
- Prescribed Burning (338)
- Range Planting (550)
- Road/Trail/Landing Closure and Treatment (654)
- Woody Residue Treatment (384)

**Additional General Requirements when controlling Juniper:**

Old growth juniper characteristics will be reviewed and identified on-site with the landowner and timber operator prior to treatment. All old growth will be excluded from treatment. Consult Figure 1 in conjunction with Table 1 within this specification for details regarding how to differentiate between old growth juniper and younger juniper.

Damage to non-juniper species shall be minimized except where consistent with the goals and purpose of the conservation plan. Such species will be identified in the plans, practice requirement sheet, and supporting materials.

Rock outcrops and lava spurs shall remain untreated except where specifically identified as consistent with a habitat recovery plan for the site.

#### **IV. SPECIAL CONSIDERATIONS**

Many chaparral vegetation types are home to rare, threatened or endangered species, those chaparral types should be avoided completely when considering this practice. Those include; Coastal sage and chaparral scrub (also known as maritime chaparral), riparian shrub plant communities, sage steppe, Ione chaparral, serpentine chaparral. Chamise chaparral with soils with less than 20" depth and areas with large "old growth" manzanita should be avoided.

Care should be taken and consultation with biologist in planning brush management activities in interior chaparral and woodlands, montane chaparral and associated woodlands.

Treatment design and layout should be done to create openings that appear as a mosaic pattern. Care should be taken to avoid a blocky or clear-cut appearance.

When clearing brush focus on old decadent plants. Design the treatment so that smaller sections, 5-10 acres with an uneven edge, or more natural appearance.

## V. METHODS

Methods to be used are described in the conservation plan and noted on the Implementation Requirement sheet(s) and supporting materials:

- Manual Treatment - Individual plants are cut down with chainsaw or other hand-held cutting tools.
- Mechanical Treatment – Brush is pushed, cut, or masticated using a tracked feller buncher, hydraulic shear, articulated grinder, Hydro-Ax, crawler tractor equipped with blade or brush rake, an excavator equipped with a masticator head, or other equipment specified in the plans and shown on the Implementation Requirement sheet. All mechanical treatments are limited to where average slopes are less than 35% in order to reduce impacts on non-target species and soil condition. Use of articulated grinders or other masticators which shred standing material may greatly reduce or eliminate the need for additional post treatment of biomass where juniper cover is less than 15% unless otherwise noted on the practice requirement sheet. Excessive soil disturbance and soil accumulation in brush piles or windrows will be avoided.
- Chemical Treatment – Individual or groups of plants are treated using approved materials consistent with the chemical label and associated legal requirements. *In accordance with NRCS policy, NRCS personnel are not authorized to provide recommendations for herbicide use.* Any chemical use will be done by the landowner consulting with local Cooperative Extension, chemical company representative or qualified agricultural consultant for specific recommendations.
- Biological Treatment – Use of approved insects or other agents may be specified consistent with associated legal requirements. Grazing with alternative 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 agent or 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. If the area is grazed by livestock, a grazing plan will be developed according to 528-Prescribed Grazing standards and specifications for all treated acres prior to application of brush management.

Multiple year treatment methods can include mechanical, manual, biological, or chemical either in combination or the same treatment method in consecutive years.

## VI. MANAGEMENT FOLLOWING TREATMENT

Post-treatment of coarse woody debris (biomass) will be consistent with the goals and objectives of the conservation plan and as detailed in the Implementation Requirement sheet and supporting materials. Soil disturbance will be minimized through adherence to appropriate road/traffic plan and temporary water diversions such as waterbars will be removed where accumulation of surface flows are likely to result in gully erosion or other impacts to on-site or off-site resources. Some alternatives for post treatment operations may be used in combination with each other in

order to achieve the desired post treatment conditions. Unless otherwise noted on the Implementation Requirement sheet, an acceptable range of brush debris cover is an average 5% to 35% of the treatment area; this includes material in contact with the soil as well as that above the soil surface such as removed tree limbs and felled trunks.

When controlling **Juniper**, management following treatment includes one or more of the following:

- Chipping – Coarse woody debris is mechanically chipped on-site and is left on-site or removed for proper disposal such as for co-gen energy production. Except where specifically described in the treatment plan, when left on-site to naturally decompose, chip depth will not exceed 3” across the treatment area and will not exceed 2” in depth in any area exceeding 100 square feet so as to allow germination and recovery of sagebrush steppe plant species. Chipping of cut material is mainly applicable to treatments of juniper stands having primarily over 25% canopy cover.
- Piling and Burning – In order to reduce the potential for substantial increases of invading annual plants, burning will occur when soils are frozen or saturated. Burn pile locations will be sited within the treatment area unless otherwise noted on the practice requirement sheet and supporting documentation. On-site burn pile locations will be flagged in advance and located as described in the practice requirement sheet and/or other supporting documentation. Populations of sensitive plant species and/or habitat as identified on the practice requirement sheet and/or supporting documentation will be avoided such that burning and associated activities reduce potential impacts to identified resources. Moving and piling of slash will be done manually or mechanically stacked unless specified in the practice requirement sheet. Pushing of slash using a bulldozer blade is prohibited. Burning of piled slash will be consistent with local and state requirements such as burn permits and air quality regulations. Piling and burning may be used in conjunction with lop and scatter or other methods in order to reduce ground cover of biomass. Piling and burning is generally most applicable where standing juniper canopy cover is over 10% but under 30%.
- Piling – Juniper piles left to provide habitat values will not exceed 4’ in height and will be located as flagged in the field or less in order to improve habitat quality for sagebrush steppe dependent species. Areas where sensitive plant species occur will be avoided as indicated on the practice requirement sheet and/or supporting documentation. Piling for habitat values is generally done by hand or with limited equipment use in cases where equipment is already operating inside the project area.
- “Drop and Drive” – Where juniper is to be felled by chainsaw or other manual method and left in place to decompose, individual trees will be limbed to reduce the height of the felled juniper to 4’ or less in order to improve habitat quality for sagebrush steppe dependent species. Whenever feasible, intact sensitive species identified on the practice requirement sheet will not be inhibited by the placement of the dropped juniper or associated slash. This approach is most applicable to situations where juniper canopy cover is less than 10%.
- Lop and Scatter – Where this approach is used, cut material is distributed in a manner which does not inhibit the release of intact sensitive species identified on the practice requirement sheet. Treatment may be mechanical or manual. This method is mainly applicable to areas where juniper canopy cover is less than 20%.

If chemical methods of treatment are used, all label restrictions concerning grazing, haying, or other uses will be applied.

Treatment areas with perennial herbaceous vegetation will be deferred from livestock grazing for the entire growing season (spring green up until seed set of key species each spring and summer) for a *minimum of one year* if the area receives at least 10 inches average annual precipitation and a *minimum of two years* if the area receives less than 10 inches average annual precipitation following the treatment, except for a specific kind of browsing animal being used as a biological control method. Additional periods of livestock deferral may be needed prior to treatment application based on the treatment method used. If chemical methods of treatment are used, all label restrictions concerning grazing, haying, or other uses will be applied.

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 cooperators of required additional deferment periods.

## **VII. MONITORING**

The collection of baseline and post treatment data is required to determine the effectiveness of the brush management application. Minimum data collected will include an estimate or measurement of pre-treatment cover or density based on aerial photography or field data and photographs documenting post-treatment conditions. Other methods may be desired depending on the treatment objectives.

Monitoring techniques are identified by the conservation planner and implemented by the client or designated parties.

## **VIII. MAINTENANCE**

The life of this practice can be assured or extended by thorough and timely operation and maintenance. Some recommendations to help develop a successful operation and maintenance program include:

- Prescribed Grazing shall be applied to ensure desired response from treatments.
- Following initial application, some regrowth, sprouting, or reoccurrence of brush should be expected and planned for.
- Spot treatment of individual plants or areas will be done as needed.
- Landings, roads, and skid trails will be surveyed for undue erosion subsequent to treatment and corrective actions taken as needed to prevent hydrologic connection of non-natural drainage features.
- In some situations, it may be appropriate to apply a maintenance treatment following a previous brush management treatment, to extend the life of the practice and achieve desired long-term objectives.

## **IX. OTHER REQUIREMENTS**

The owner, operator, or other persons shall conduct all work and operations in accordance with proper safety codes for the type of equipment and operations being performed with due regard for the safety of all persons and property.



Figure 1 –Old Growth versus Young Growth Western Juniper (Consult Table 1 for key differentiating factors)

<b>Table 1. Western Juniper Growth Form* and Site Characteristics</b>		
<b>Characteristic</b>	<b>Relatively Young Trees</b>	<b>Relatively Old Trees</b>
Crown shape	Conical with pointed tip	Flattened, rounded, or uneven top
Branch structure	Branches become progressively smaller from bottom to top of tree	In open stands, large branches near the base
Dead wood	Little dead wood in the bole, few dead branches, little to no foliose lichen	Dead branches, bark missing, covered by a light green lichen.
Bark	Flaky, relatively thin with limited or shallow vertical furrows	Thick, fibrous with well-developed vertical furrows
Leader growth	Terminal leader growth in the upper ¼ of the tree, usually >2 in. In open stands, leader growth >2 in. from bottom to top	Leader growth in the upper ¼ of the tree usually <1 in.
Site Location	Due to broken fire cycle, younger trees have encroached upon a range of sites, including those with fair to good quality soils. Vegetation is typically dense when compared to sites where old-growth juniper typically occurs.	Tree locations protected from recurring fire due to low fuel continuity. Typical areas include ridge tops, lava spurs and other sites of low productivity such as those with very shallow and/or rocky soils.

\* Growth form and morphological characteristics vary across trees and stands so usually several characteristics are required to differentiate between young and old individuals of the species.

Miller, R.F., J.D. Bates, T.J. Svejcar, F.B. Pierson, and L.E. Eddleman. 2007. Western Juniper Field Guide: Asking the Right Questions to Select Appropriate Management Actions. U.S. Geological Survey Circular 1321.