

**NATURAL RESOURCES CONSERVATION SERVICE**  
**CONSERVATION PRACTICE STANDARD**

**BRUSH MANAGEMENT**

(acre)  
**CODE 314**

**DEFINITION**

Removal, reduction, or manipulation of non-herbaceous plants.

**PURPOSE**

This practice may be applied as part of a conservation management system to accomplish one or more of the following purposes:

- Restore natural plant community balance.
- Create the desired plant community.
- Reduce competition for space, moisture and sunlight between desired and unwanted plants.
- Manage noxious woody plants.
- Restore desired vegetative cover to protect soils, control erosion, reduce sediment, improve water quality and enhance stream flow.
- Maintain or enhance wildlife habitat including that associated with threatened and endangered species.
- Improve forage accessibility, quality and quantity for livestock.
- Protect life and property from wildfire hazards.
- Improve visibility and access for handling livestock.

**CONDITIONS WHERE PRACTICE APPLIES**

On rangeland, native or naturalized pasture, pasture and hay lands where removal or reduction of excessive woody (non-herbaceous) plants is desired.

**CRITERIA**

**General Criteria Applicable to All Purposes Stated Above**

Brush management will be designed to achieve the desired plant community in woody plant density, canopy 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, biological, or a combination of these methods.

Brush management will be designed and applied only after determining whether or not the State of Hawaii has a biological control program for the target species so as to avoid injuring beneficials.

Where applicable, proper grazing will be applied to facilitate the desired response from treatments.

**Additional Criteria for Improving Wildlife Habitat**

Brush management will be planned and applied to meet the habitat requirements of wildlife. It will not adversely affect threatened or endangered species or their habitat.

### Additional Criteria for Reducing Wildfire Hazards

Control undesirable woody plants in a manner that creates the desired plant community which does not provide wildfire hazard conditions.

### Target Species

Phenology and environmental constraints must be considered if initial treatments are to be successful. In addition, acceptable control levels should be specified in the planning phase.

Examples of major target species included under this practice are:

blackberry	( <i>Rubus ellipticus</i> )
black wattle	( <i>Acacia decurrens</i> )
cats-claw	( <i>Caesalpinia sepiaria</i> )
christmasberry	( <i>Schinus terebinthifolius</i> )
firetree	( <i>Myrica faya</i> )
formosa koa	( <i>Acacia confusa</i> )
gorse	( <i>Ulex europaeus</i> )
guava	( <i>Psidium guajava</i> )
hamakua-pamakani	( <i>Ageratina riparia</i> )
hila hila, sensitive plant	( <i>Mimosa pudica</i> )
java plum	( <i>Syzygium cumini</i> )
kiawe	( <i>Prosopis pallida</i> )
klu	( <i>Acacia farnesiana</i> )
koa haole	( <i>Leucaena leucocephala</i> )
lantana	( <i>Lantana camara</i> )
maui-pamakani	( <i>Ageratina adenophora</i> )
melastoma	( <i>Melastoma malabathricum</i> ) ( <i>M. candidum</i> )
miconia	( <i>Miconia calvescens</i> )
panini, prickly pear cactus	( <i>Opuntia megacantha</i> )
silk oak	( <i>Grevillea robusta</i> )
thimbleberry	( <i>Rubus rosaefolius</i> )
waiawi, strawberry guava	( <i>Psidium cattianum</i> )

### Associated Vegetation

Response by vegetation is often the determining factor influencing the success of a brush management practice. If

increased forage is the objective, inability of forage species to take quick advantage of improved growing conditions by species may limit success. Availability of livestock water is a primary contributor to the producer's ability to increase the harvest of forage and to extend the longevity of the brush management investment. If improvement of wildlife habitat is the objective, planning should include specified levels of cover for individual species. If fuel load reduction is the objective, acceptable levels of woody plant control should be specified. If water quality improvement is the objective, reasonable chances of improving herbaceous cover while reducing woody cover should exist. When improved recreation and aesthetic values through increased landscape diversity are the objectives, descriptions of desired vegetation type distribution should be provided.

### Available Methods of Control

Brush management objectives and feasible methods of control are contained in the specification guide of this supplement.

### Follow-up Management

Management following initial treatments must be specified during the planning process. Decision-makers must be aware of maintenance and management requirements to ensure success and prolong the life of initial treatment.

### Landuser Objectives

Realistic goals for the management unit as well as the operating unit should be discussed and identified with decision-makers. A realistic assessment of goals may identify methods of vegetation manipulation that are less costly and have a higher probability of success than traditionally used methods.

### CONSIDERATIONS

It is the policy of the Natural Resources Conservation Service to encourage the use of pest-control methods having the least potential hazard or adverse impact on man,

animals and the environment. Best management practices shall be recommended at all times. Brush management is a complex practice that must be fitted to the particular target species, the adapted vegetation, the adapted methods of control and subsequent management.

Planners are to help land users understand the environmental impacts of brush management, both positive and negative, onsite and offsite by assisting cooperators in considering the following:

- The expected effect on wildlife habitat, recreation use, historic or cultural resources, wetlands and attractiveness of the landscape.
- The technical requirements, possible hazards and costs of the practice.
- The grazing management and maintenance measures that will ensure success.

Timing and sequence of brush management in a field and /or the entire operating unit should be planned to facilitate needed grazing management.

Consider soil erosion potential and difficulty of vegetation establishment when choosing a method of control that causes soil disturbance.

When primary use of rangeland is for domestic livestock, the objective may be to manipulate numbers, species and distribution of brush to approximate that of natural conditions. When use is also for wildlife, the objective may be to maintain more brush than is natural for the site and to manage the brush in a pattern that favors both livestock and wildlife.

It is usually a goal to exclude all brush on pastureland except for odd areas, mounds, draws left for shade, wildlife, or aesthetic value. Caution should be taken with an extreme no brush concept because livestock browse is a major contribution to summer and fall forage quality contributions.

On land where wildlife is important, brush should be manipulated to provide optimum wildlife habitat and to facilitate wildlife management.

Mechanical, chemical and biological procedures may be used singly or in combination, depending on kind of land (site); topography; species of woody plants—whether they are root-sprouters or non-sprouters; size, abundance and distribution of woody plants; hazards of treatment, if any; objectives of the land user; and costs in relation to expected benefits.

## **Practice Effects**

### **Soil**

Successful brush management results in improved vegetative cover. Improved vegetative cover slows surface runoff, reduces onsite and offsite deposition, reduces sheet and rill erosion, increases root mass, improves soil tilth, increases surface litter and increases organic matter.

### **Water**

Infiltration will increase and runoff will be reduced as competing brush is replaced by grass cover. In order to sustain improved water infiltration following brush management, sound grazing management practices must be implemented.

The improvement in vegetation diversity and the decrease in runoff will reduce the amount of erosion and sediment yield. Improved vegetative cover acts as a filter to trap the movement of dissolved and sediment attached substances, such as nutrients and chemicals from entering downstream water courses. Mechanical brush management may initially increase sediment yields and soluble and sediment attached substances carried by runoff because of soil disturbance and reduced vegetative cover. This is temporary until revegetation occurs.

### **Air**

The long-term effect will be a general improvement in air quality. There may be a slight reduction initially, depending on the methods used to control brush.

### **Plant**

Health, vigor and productivity of suitable species will improve because of removal of target species that compete for space, sunlight, moisture and nutrients. Short-term loss in productivity may occur because of disturbance of soil caused damage to desired plants and increased weeds.

### **Animal**

There will be an improvement in the feed/forage balance in the long term. Animal health will improve. Habitat will generally improve for domestic animals and wildlife; however, there may be an initial short-term loss of cover.

For additional information on the physical effects of this practice on resource concerns, refer to Section V of the FOTG.

## **PLANS AND SPECIFICATIONS**

Site-specific specifications which document the requirements for installing, operating and maintaining the practice on a particular site to achieve its intended purpose(s) shall be prepared in accordance with this standard and the practice specification.

The site-specific specifications shall be documented on the Brush Management Jobsheet and given to the client. Other documents, such as practice worksheets, maps, drawings, and narrative statements in the conservation plan may be used to plan or design the practice and to prepare the site-specific specifications.

The site-specific specifications shall document the following, as a minimum:

- Purpose of client applying practice.
- Species to be managed (target species) and species to be benefited.
- Areas to be treated, including location shown on maps or drawings and/or per a description. Acres to be treated.
- Brush / tree stand information for target species (density, percent canopy cover and/or species numbers per acre).
- Required treatment level.

- Management requirements before and after treatment.

For mechanical treatment methods, plans and specifications will include:

- Type of equipment to be used.
- Modifications necessary to enable the equipment to adequately complete the job (if any).
- Dates of treatment.
- Equipment operating instructions.
- Techniques or procedures to be followed.

For chemical treatment methods, plans and specifications will include:

- Herbicide name.
- Rate of application and spray volumes.
- Dates of application.
- Mixing instructions (if applicable).
- Method of application.
- Any special application techniques, timing considerations, or other factors that must be considered to ensure the safest, most effective application of the herbicide.
- Reference to label instructions.
- Notification that special documentation will be required to be completed, if a restricted chemical is to be used. And to contact the Hawaii State Department of Agriculture for the specifics regarding special documentation requirements, before using a restricted chemical.

For biological treatment methods, plans and specifications will include:

- Kind of biological agent or grazing animal to be used.
- Timing, duration and intensity of grazing or browsing.
- Desired degree of grazing or browsing used for effective control of target species.
- Maximum allowable degree of use on desirable non-target species.

- Special precautions or requirements when using insects or plants as control agents.

### **Specifications Guide**

For major brush species, consider:

- Dates of growth periods for effective treatment.
- Acceptable alternative materials, equipment, and methods.
- Types or areas.
- Patterns of vegetation.
- Kinds and amounts of brush and trees that should be favored (left) for wildlife habitat.
- Natural beauty and recreation.
- Maintenance and management needed to follow brush control treatment.

## **OPERATION AND MAINTENANCE**

### **Operation**

Brush Management practice shall be applied using NRCS approved materials and procedures. Operations will comply with all local, state and federal laws and ordinances.

### **Maintenance**

Following initial application, some regrowth, resprouting, or reinfestation of brush should be expected. Spot treatment of individual plants or regrowth areas should be done in a timely manner.

Success of the practice shall be determined by evaluating regrowth or recurrence of target species after sufficient time has passed to monitor the situation and gather reliable data. Evaluation periods will depend on the methods and materials used.

### **REFERENCES**

Larson, J. E. 1980. *Revegetation Equipment Catalog*. U.S.F.S. Equipment Development Center, Missoula, Montana. 198 pp.

Motooka, P. S. 1981. *Chemical Weed Control in Pastures and Ranges of Hawaii*. Hawaii Institute of Tropical Agriculture and Human Resources, University of Hawaii. Research Extension Series 009. 12pp.

Motooka, P.S., G. Nagai, L. Ching, J. Powley, G. Teves, and A. Arakaki. 1992. *Woody Plant Control for the Homeowner*. Hawaii Institute of Tropical Agriculture and Human Resources, University of Hawaii. Brief No. 105. 4 pp.