

**NATURAL RESOURCE CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

BRUSH MANAGEMENT

(Ac.)

CODE 314

DEFINITION

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

target woody species and protection of desired species, and will be accomplished by mechanical, chemical, biological, prescribed burning or a combination of these methods.

PURPOSE

- Restore natural plant community balance.
- Create the desired plant community.
- Manage noxious and invasive 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 habitat associated with threatened and endangered species.
- Improve forage accessibility, quality and quantity for livestock.
- Protect life and property from wildfire hazards.

Brush management will not be applied to only a part of a pasture unless the entire pasture can be managed according to the needs of the treated area.

No single treatment of target species is adequate to solve a woody plant problem but rather a system approach should be employed which may include a combination of treatment alternatives utilized over several years.

Refer to Attachment 2 for categories of brush densities including size and number of stems per acre.

Where brush mixtures occur that include one or more species for which approved methods have been established, recommended control will be that prescribed for the species that is the greatest problem, provided one method will give adequate control of the different species, so that none of the species will continue to be a problem. If not possible, separate control methods may be needed.

CONDITIONS WHERE PRACTICE APPLIES

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

Mechanically disturbed areas must be re-vegetated if 25% or more of the existing grass cover is destroyed by mechanical disturbance or if reseeding from existing seed sources will not provide adequate cover. Refer to Pasture and Hay Planting (Practice Code - 512) or Restoration and Management of Declining Habitats (Practice Code – 643)

CRITERIA

General Criteria Applicable to All Purposes

Brush management will be planned to achieve the desired plant community in woody plant density, canopy cover or height.

Where livestock are present, Prescribed Grazing (Practice Code – 528A/528) will be planned, applied and monitored before and after treatment to ensure the desired response from brush management treatments.

Brush Management will be applied in a manner to achieve the desired control of the

Brush management will be planned in a manner that will not adversely affect threatened or endangered species or their habitats.

Cultural resources will be considered when planning brush management. Brush management has the potential for adversely affecting cultural resources and compliance with GM 420, Part 401 during the planning process is necessary.

Where appropriate, local cultural values will be incorporated into practice design in a technically sound manner.

Brush Management will be applied in accordance with all applicable federal, state, and local laws and regulations, including permits, permissions, or notifications if required.

Additional Criteria to Maintain or Enhance Wildlife Habitat, Including habitat Associated with Threatened and Endangered Species.

Brush Management will be planned and applied in a manner to meet the habitat requirements of the wildlife of concern.

Additional Criteria to Protect Life and Property from Wildfire Hazards

Control undesirable woody plants in a manner that creates the desired plant community which reduces wildfire hazard conditions.

CONSIDERATIONS

Timing and sequence of brush management in a pasture and/or the entire operating unit should be planned in order to ensure needed forage is available for the grazing animals.

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

Areas of critical wildlife habitat should be pointed out and the landowners encouraged to exclude them from the treatment area, such as:

- Areas on steep escarpments, ravines, rocky hillsides, and other rough formations and
- Tree-lined drainages.

Manage to provide adequate wildlife travel lanes, escape cover, loafing areas, and food plants.

PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for each pasture, field, or management unit where Brush Management will be applied.

Plans and specifications will be based on the practice standard and may include narratives, maps, drawings, job sheets, or similar documents. These documents will contain the following data as a minimum:

- Brush canopy and/or target species count will be quantified using either transect line locations and percent canopy and/or species numbers and basal diameter per acre of the target plant(s).
- Maps or drawings showing areas to be treated and areas to be left undisturbed.
- Plans for revegetating when needed.
- Management following brush management treatment.

Mechanical Treatment

For mechanical treatment methods, plans and specifications will include:

- Types of equipment
- Modifications necessary to enable the equipment to adequately complete the job
- Dates of treatment
- Operating instructions
- Techniques or procedures to be followed

Chemical Treatment

For chemical treatment methods, plans and specifications will include:

- Herbicide name (not brand name)
- Rate of application or spray volumes
- Acceptable dates of application
- Mixing instructions (if applicable)

- Any special application techniques, timing considerations, transportation, storage, or other factors that must be considered to ensure the safest, most effective application of the herbicide
- Reference to label instructions
- 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.

Woody plants vary among species in susceptibility to herbicides, and accurate knowledge of target species is essential. For additional guidance on specific herbicides refer to the Illinois Agricultural Pest Management Handbook, Chapter 10 – Brush Control in Illinois. Preferred methods of treatment may include:

Foliage stem sprays: Sprays are applied to stem and foliage. This type of application is least effective on resprouting species. Application is most effective when sprays are applied just after full-leave expansion in the spring or early summer. Preventing drift to surrounding areas is more difficult with this method.

Low-pressure coarse sprays with drift reduction additives are recommended.

Basal Bark Spray: Basal spraying is a technique to deaden small trees, shrubs, and occasionally vines by spraying the green bark of the lower trunk (12 to 15) inches with herbicide.

The intent is for the herbicide to penetrate the bark and kill the tree and any basal buds that might sprout.

Herbicides used for basal spraying are generally applied in oil carriers. The technique is effective on trees less than four to six inches in diameter. As bark becomes rougher and thicker, this technique becomes less effective. Care must be taken when herbicide is applied to minimize the amount that runs into the soil. This is important not only from an

environmental quality standpoint, but also to avoid damaging non-target woody species.

Cut Stump: Chemical is applied to freshly cut stump surfaces. Treat plants before the cut surface dries (within two to three hours after cutting) for optimum control. How much of the stump that should be treated depends on the formulation of herbicide used. Many of the herbicides labeled for cut stump application are water-soluble. It is not necessary to treat the entire stump with these materials. The critical area of the stump that must be treated to prevent sprouting is the sapwood and bark of the stump's cut surface. Stump treatment with water-soluble herbicides must be done immediately after cutting the tree or vine in order to be effective.

Other herbicides labeled for cut stump applications are formulated to be mixed with oil. These herbicides do not move readily within the plant, but penetrate the bark. To be effective in suppressing stump sprouting, the entire stump, and particularly the bark and exposed roots must be thoroughly sprayed. Timing is critical with these materials because they are not so dependent on movement downward from the cut surface to distribute the herbicide. In situations where immediate treatment of stumps is not possible, use a herbicide with a oil carrier rather than one with a water carrier. Treatment with an oil-carried herbicide is recommended in the spring when treating species that exhibit a spring "sap flow". Water-carried herbicides will usually not be adequately absorbed to be effective during the spring "sap flow".

Frill, hatchet, or girdling: Frilling and girdling are methods of controlling standing trees that may be done with or without a herbicide. The bark around the base of the trunk is cut and the herbicide is either applied as a separate step or injected simultaneously in the cambium area. These techniques require a considerable amount of time and labor to implement.

Space Cuts – Tree injection: Tree injection involves introducing a herbicide into the undesirable tree through spaced cuts made around the trunk of the tree with an axe, hatchet, or tree injector. The amount of herbicide to be placed in the cut is specified on

the herbicide label, but is generally around 1 to 2 milliliters. There are various tree injectors available on the market that are hatchets constructed to inject herbicide when struck into a tree.

Soil Application: This type of treatment includes pellets, beads, granules or concentrated liquids. The herbicide moves through the soil to the root zone and then translocates upward to kill the plant. Treatment is usually made at the base of the plant within the dripline.

Nearby trees may be injured or killed if their roots extend into the treated area.

Soil applied herbicides usually remain active in the soil for several months or even years. Treatments can be made at any time of the year when the ground is not frozen, but control will only occur after sufficient rain has fallen. Soil Application should only be used on non-erosive soils and areas that do not pose a problem to ground or surface water contamination..

Biological Treatment

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 use 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

Refer to Attachment I for guidance in utilizing goats as a biological management option.

Prescribed Burning Treatment

- Refer to Prescribed Burning Standard (Practice Code 338) for guidance.

- Species controlled by prescribed burning are generally more effectively and economically controlled prior to reaching a medium category (see Attachment 2).
- A backfire will result in most species that are less than a 2 inch basal diameter to be killed to the ground, causing basal resprouting the following year.
- Successive prescribed burn treatments may be necessary to maintain desired control.

NEEDS AND PRIORITIES FOR TREATMENT

The kind and density of the species present and the land use objectives govern brush management planning on grasslands.

Crown canopy is defined as the percent of the ground shaded by a species with the sun in a vertical position over the species.

Brush management priorities are determined by the percent crown canopy of the species of concern (See Attachment 2).

A medium priority/category indicates that the brush species is significantly reducing the growth of desirable herbaceous vegetation.

Certain brush species such as Red Cedar, Osage Orange, Honey Locust, Multiflora Rose, (a secondary noxious weed), Bush Honeysuckle, and Autumn and Russian Olive provide a seed source that is capable of serious infestations.

Grazing management and other management practices can generally control undesirable species that occur at lower densities.

OPERATION AND MAINTENANCE

Operation: Brush Management practices shall 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 regrowth or reoccurrence 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.

Maintenance: Following initial application, some regrowth, resprouting, or reoccurrence of brush should be expected. Spot treatment of individual plants or areas needing retreatment should be done as needed.

REFERENCES:

- **Hager, Aaron G., and Nordby, Dawn.** 2004 ILLINOIS AGRICULTURAL PEST MANAGEMENT HANDBOOK, Chapter 10 – Brush Control in Illinois, Department of Crop Sciences, University of Illinois, Champaign, Illinois, <http://www.ipm.uiuc.edu/pubs/iapmh/10chapter.pdf>
- **Bradley, Kevin W., and Kendig, Andrew J.** WEED AND BRUSH CONTROL GUIDE FOR FORAGES, PASTURES AND NONCROPLAND, Department of Agronomy, University of Missouri, Springfield, MO <http://muextension.missouri.edu/xplor/misc/pubs/mp0581.htm>
- **Heiligmann, Randall B.** Controlling Undesirable Trees, Shrubs, and Vines in Your Woodland, School of Natural Resources, Ohio State University, Columbus, OH <http://ohioline.osu.edu/fact/0045.html>
- **Hartzler, Bob, and Owen, Mike.** 2005 Herbicide Manual for Ag Professionals, Department of Agronomy, Iowa State University, Ames, IA <http://www.weeds.iastate.edu/reference/wc92/default.htm>
- **Doll, Jerry.** Brush Management in Wisconsin, Weed Science, University of Wisconsin, Madison, WI http://ipcm.wisc.edu/uw_weeds/extension/articles/brushmgmt.htm
- **McGinty, Allan; Cadenhead, J. F.; Hamilton, Wayne; Hanselka, Wayne C.; Ueckert, Darrell N.; and Whisenant, Steven G.** Chemical Weed and Brush Control Suggestions for Rangeland, Texas Agricultural Extension Service, Texas A & M University, College Station, TX <http://texnat.tamu.edu/publications/B-1466.pdf>
- **McGinty, Allan and Welch, Tommy G.** Brush Control for Small Acreages, Texas Agricultural Extension Service, Texas A & M University, College Station, TX <http://texnat.tamu.edu/publications/L-2227.pdf>

ATTACHMENT 1

BIOLOGICAL BRUSH CONTROL

Use goats for follow-up treatment after dozing, chopping, mowing, prescribed burning, shredding, or for initially controlling Multi-flower Rose, Honeysuckle, or other brush species. The use of goats is never the primary brush treatment unless the brush is already accessible for control by goats. Use brush heavily in spring after leaves are fully developed to assure complete defoliation by June 1. Control only the amount of area at one time that goats can be concentrated on for sufficient defoliation. Pastures that are being "goated" for brush management will not be grazed with other kinds of livestock.

The following methods will be used to control brush with goats:

1) Priority Pastures

Choose two pastures to rotate goats between and assign one first priority and the other second priority.

Sufficient number of goats are needed to maintain 85 percent defoliation in the first priority pasture and 65 percent defoliation in the second priority pasture, if brush is mechanically controlled in that pasture.

Control the brush mechanically in the first priority pasture.

Initiate "goating" when leaves are fully developed in late April or early May. Place the goats in the first priority pasture at the rate needed and as often as necessary to maintain at least 85 percent defoliation. When the goats are not in the first priority pasture, they will be placed in the pasture with second priority. Maintain the rotation for the full growing season. If possible, defer the pasture during winter and spring while brush is dormant.

During the second year, reverse priority on the pastures and proceed with the rotation.

Recommend deferring the pasture to be mechanically treated and goated in the spring during the prior fall with no winter grazing.

2) Thirty (30) Days In and 30 Days Out

The most effective control occurs when new leaves and twigs are browsed in the initial stage of growth immediately following full leaf expansion. Stock with sufficient goats to obtain at least 65 percent defoliation in approximately 30 days. After defoliation, rest the pasture for approximately 30 days. The system is a 30-day in and 30-day out grazing system with goats - resulting in at least 3 months of rest each growing season. A minimum of 3 years of goating is generally needed to obtain desired control. Defer pastures during winter and spring while brush is dormant.

3) Fifteen (15) Days In and 15 Days Out

Apply the system in the same manner as the 30-day in and 30-day out except that a 15-day in and 15-day out rotation is utilized.

Attachment 2

Priority Categories to be used for Brush Management (314)

“Area”, as mention in the categories, refers to rangeland, native pasture, naturalized pasture or haylands. Woodlands, wooded draws, and fence rows are not to be considered.

“Woody stems”, “woody cover”, or “woody vegetation” as mentioned in the Category Description refer to Autumn Olive, Russian Olive, Hawthorn, Eastern Red Cedar, Honey Locust, Osage- Orange, Multiflora Rose, Bush Honeysuckle, and Amur Honeysuckle.

Priority/ Category	Category Description	Canopy
Low	Ninety percent (90%) or more of the area in grass and broadleaved herbaceous plants. Up to 10% of the area in scattered woody stems with stems two inches (2") or less in diameter at ground line.	< 10%
Medium	Sixty percent (60%) or more of area in grass and broadleaved herbaceous plants. Or up to forty percent (40%) of the area in light woody cover with stems two inches (2") or less in diameter at ground line.	10% – 30%
High	More than forty percent (40%) of area occupied by woody vegetation, briars, vines or woody stems two inches (2") in diameter or less at ground line; but can include up to twenty-five (25) stems per acre greater than two inches (2") at ground line.	30% – 50%
Very High	More than forty percent (40%) of area occupied by woody vegetation greater than two inches (2") in diameter at ground line; or more than twenty-five (25) stems per acre greater than two inches (2") in diameter at ground line.	>50%