

**NATURAL RESOURCE CONSERVATION SERVICE
CONSERVATION PRACTICE
GENERAL SPECIFICATION**

BRUSH MANAGEMENT

(Acre)
CODE 314

General Use

Brush Management will be applied to achieve the desired control of the target woody species and protection of desired species. This will be accomplished by mechanical, chemical, biological, prescribed burning or a combination of these methods. When prescribed burning is used the Prescribed Burning standard 338 will be used.

Where erosion and sedimentation are resource concerns as a result of excessive woody plant canopy cover, and competition with herbaceous species, Brush Management is an essential practice.

Brush management will not be applied to only a part of a pasture unless the entire management unit can be managed according to the needs of the treated area. Treated areas may be temporarily fenced off to achieve management goals.

A serious concern exists when brush densities exceed 10% crown canopy and/or are in excess of 50 plants per acre. Some introduced woody species may warrant treatment at any density or canopy if they are documented to be highly invasive. In these cases treatment should be applied early to contain the future spread of these plants.

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. If this is not possible, separate control methods may be needed.

Each conservationist must analyze the brush stand with the land user and consider the total impact of brush management on the environment. Once all alternatives and values have been analyzed, a plan can be formulated and decisions can be made.

It should be understood that 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.

Initial treatments must be followed by maintenance-type treatments planned to prevent costly primary treatments from re-occurring, to protect the resources, and to extend the effective life of the primary treatment.

Brush management should be planned depending on such factors as kind of land and/or 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, costs in relation to expected benefits, and extent of existing erosion or erosion potential.

Where livestock are present, Prescribed Grazing (528) shall be applied to ensure the desired response from treatments.

- 1) Mechanical Brush Management– Attachment I.
- 2) Chemical Brush Management– Attachment II
- 3) Biological Brush Management- Attachment III

VARIANCES

Any requests for variances are to be submitted to the State Rangeland Management Specialist.

BRUSH MANAGEMENT PLAN

The Brush Management Plan will include:

1. **Goals and Objectives** clearly stated with target species identified.
2. **Brush Inventory** that identifies:
 - a. Soils and ecological site map
 - b. Pretreatment brush canopy cover or density documentation (i.e. brush transects/density determinations)
 - c. Topography map
 - d. Brush management plan map (special treatment areas delineated with target species and percent canopy or density identified)
 - e. T&E species and cultural resources documented in the CPA-52
3. **Monitoring plan** identified for what will be measured, how often, changes in the plant community as compared to objectives.
4. **Method of Treatment- Mechanical**
 - a. Plans and specs including items 1-3 above
 - b. Types of equipment,
 - c. Techniques or procedures to be followed
 - d. Dates of treatment, etc.
 - e. See attachment I
5. **Method of Treatment- Chemical**
 - a. Plans and specs including items 1-3 above
 - b. Acceptable chemical treatment references (ERM-1466 or PESTMAN)
 - c. Active ingredient with application rates and spray volume documented on LTP-963
 - d. Acceptable dates and/or plant growth stage for optimum control documented on LTP-963
 - e. Evaluation and interpretation of herbicide risks (i.e. WIN-PST as applicable)
 - f. Any mitigation, timing considerations or other factors (such as soil texture or organic matter content) to ensure the safest and most effective application of herbicide.
 - g. See attachment II
6. **Method of Treatment- Biological**
 - a. Plans and specs including items 1-3 above
 - b. Kind of grazing animal
 - c. Timing, frequency, duration and intensity of grazing or browsing
 - d. Desired degree of use
 - e. Special mitigation requirements
 - f. See attachment III

Brush Management Regarding Wildlife

Where upland wildlife species are a primary concern, Brush Management will be planned and applied to meet the habitat requirements of the species of concern.

Where the planned land use is for wildlife or recreation, and the operator is interested in maintaining all woody plants for aesthetic values, brush management will not be required except where necessary to control erosion. Conservationists should fully explain the benefits of selective brush control on wildlife habitat and aesthetics.

Inventories and evaluations will be made to determine the location and amount of woody vegetation to be retained for wildlife.

Refer to Texas NRCS eFOTG State supplements, for specific species habitat management criteria.

When T&E species occur on the management unit, brush management should be planned to not cause harm to a population or the habitat of federally listed or state listed endangered or threatened plants or animals.

Operation and Maintenance and Safety

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 re-growth or re-occurrence 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.

Safety: Certain aspects of Brush Management constitute potential agricultural pollutants to water and air. To avoid possible contamination and defilement of the resources, and to protect people, livestock, wildlife, and desirable plants against contamination, the following points will be considered by conservationists planning brush control:

- 1) Conservationists will caution persons using herbicides that if they are improperly handled or applied or if unused portions or containers are improperly disposed of, they may be injurious to humans, domestic animals, desirable plants, fish, and other wildlife and may contaminate water supplies. Users of herbicides will be cautioned to follow the directions and heed all precautions on the container label, to respect all USDA pesticide registrations and policies, and to abide by state and county regulations.
- 2) To reduce the possibility of pollution and to increase the effectiveness of the herbicide, chemical control methods should not be used during periods of unstable weather where there is a possibility of rain within 5 hours after application of the chemical.
- 3) Mechanical brush control operations should be timed so as to limit exposure of bare soil for undue periods of time. Prior to rootplowing, grubbing or other severe soil disturbing activity and aerial spraying where overhead power lines can be a problem, a utility check sheet will be completed to avoid injury and damage to equipment and utilities. The producer/contractor will call 1-800-344-8377 (1-800-DIGTESS).
- 4) When prescribed burning is used as a brush management practice, the regulations and policies of the Texas Commission on Environmental Quality (TCEQ) should be adhered to.

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

ATTACHMENT I Mechanical Brush Management

Mechanical brush management is often applied to woody species with heavy densities and top growth. Many times it is impossible to get satisfactory control without removal of top growth as a necessary part of brush management. All operations needed for brush management, with or without seeding, will be included as necessary elements. This may include any combination of the following as needed: chain, doze, rake, stack, burn, root plow, power grub, axing, etc.

General guidelines for control of root sprouting species or those species that re-sprout from basal stems are as follows:

1. Do not apply primary brush treatment when target species are root sprouters and no follow-up treatment is planned.
2. Schedule follow-up treatment when the target plant is:
 - a) MESQUITE, HUISACHE, MIXED BRUSH and their re-sprouts and/or seedlings reach an approximate 3-4 feet in height (2-3 years old following primary brush treatment).
 - b) JUNIPER and its re-sprouts and/or seedlings reach an approximate height of 20 inches (3-5 years old following primary brush treatment).
 - c) POST OAK, BLACKJACK OAK, CHINESE TALLOW, YAUPON, EAST TEXAS HARDWOODS, and its re-sprouts and/or seedlings reach an approximate height of 2-4 feet (2-4 years old following primary brush treatment).

Root plowing may be planned only when soil conditions are such that a stand of grass can be readily established.

Root plowing may cause significant structural changes of plant communities. The impacts which these changes may pose on plant and animal communities should be carefully considered during the planning phase. In most instances, where woody infestations are light to moderate, other alternatives such as grubbing or individual plant treatment with herbicides should be considered.

Raking and/or piling of brush species controlled will be based on a **documented technical determination** and will meet the objectives of the client.

Range Planting (Code 550) following mechanical brush management will be based on a **documented technical determination** of existing seed sources or seed bank. Range planting can be planned in order to meet landowner goals and objectives.

Eligible brush species, approved control methods, time of treatment, technical application follows:

SPECIES	METHOD	TIME	TECHNIQUES OF OPERATION
Agarito, Catclaw, Elbowbush, Bumelia, Lotebush, Yaupon, and other low brush species. Mixture of many species of South Texas and Southwest Texas (CHAPARRAL)	Root plow	Anytime <u>1/</u>	Stack and burn top growth as needed. Root plow to an eight to ten inch depth. Rootplow blades must be equipped with kickers (fins) to bring roots to the surface and expose crowns and/or bud zones for greatest effect. Fins should be attached at a 22 - degree angle, not over 30" apart and long enough to project into and through the soil. Follow up by repeat dozing, hand grubbing, or herbicide as necessary to control sprouts.
	Power grubbing (tree dozing), hand grubbing	Anytime <u>1/</u>	Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Stack and burn top growth as needed.
Agarito, Blackbrush, Bumelia, Catclaw, Cenizo, Elbowbush, Guajillo, Lotebush, Yaupon, Texas persimmon, and other low brush species. Mixture of many species of South Texas and Southwest Texas (CHAPARRAL)	Heavy off-set plow Rome disc and crawler tractor, & Roller chop	Anytime <u>1/</u>	Two trips over the acreage are generally required for these practices to be most effective. The second application should be plowed diagonal to the first plowing. The Rome disc must be at least 30 inches in diameter. Plow to sufficient depth to cut brush below the bud zone. These practices are intended to be used on listed species and other Rio Grande Plains low brush species and are not intended to be used on species such as Mesquite and Huisache. These practices primarily apply to shallow and gravelly sites but can include sites such as gray sandy loam and sandy loam depending on brush species present. These practices do not apply to very shallow (less than 10 inches) or rocky soils. These practices are most effective when used as a component practice for a system of brush control that is planned. Satisfactory control will not occur if planned as an independent one-time practice. Stack or burn top growth as needed.
Baccharis A common invader into old fields, pastures of Central South, and East Texas	Root plow	Anytime <u>1/</u>	Stack and/or burn top growth as needed. Root plow to a sufficient depth to undercut plants with a root plow equipped with fins that bring roots to the surface. Fins should be attached at a 22 - degree angle, not over 30" apart and long enough to project through the soil.
	Hand grub - power grubbing (tree dozing)	Anytime <u>1/</u>	Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Stack and burn top growth as needed.
HARDWOODS Blackjack oak, post oak, winged elm, yaupon, eastern persimmon, locust, eastern red cedar and Chinese tallow tree.	Root plow	Anytime <u>1/</u>	Stack and/or burn top growth as needed. Root plow to a sufficient depth to undercut plants with a root plow equipped with fins that bring roots to the surface. Fins should be attached at a 22 - degree angle, not over 30" apart and long enough to project through the soil. The plow should be equipped with fins spaced not over 30" apart, which will bring the plant roots to the surface. Stack and/or burn top growth as needed. Follow-up to control sprouts. Plow 12" to 14" and 18" on deep sands.

HARDWOODS cont.	Hand grubbing, power grubbing (tree dozing)	Anytime <u>1</u> /	Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Applicable when stems are 3" or more in diameter at breast height (dbh). Apply only when soil has good moisture to a depth of at least 12". Stack and/or burn top growth as needed. Grub to at least a 14" depth. Control sprouts as needed with livestock, acceptable chemicals, prescribed fire, or mechanical methods.
	Chain	Anytime <u>1</u> /	Chains must weigh 50 lbs. per link or more. Chain two ways. Soil moisture should be sufficient to allow uprooting of target species. Be aware that chaining will spread prickly pear. Follow-up to control sprouts is a necessary part of the treatment.
	Axe, Girdle	Anytime <u>1</u> / (May to September)	Girdle trees 6 to 8" in diameter by removing a 3" width of cambium layer. Cut down smaller trees and chemically treat stumps to prevent sprouting.
Creosote, Tarbush Desert shrub common to Trans-Pecos and Southwest Texas	Dragging, riling, standard chaining (tarbush dominant areas only)	Anytime	<u>This practice is only partially effective in controlling these species.</u> It is most successful if used following rain when soil is moist and plants are fully leafed out. Chaining only effective when tarbush plants have their crown exposed to permit pullout of roots. Use naval anchor chain that has a minimum size-of-the-link diameter of 2-1/4 inches.
	Ely and disc chaining	Anytime	Not applicable on fine-textured soils. Should not be used when mesquite is a predominant species. Must be followed by range seeding. Chains are pulled in a "J" pattern. Two-way chaining in opposite directions is a minimum requirement with Ely chain.
	Rootplow or disc	Anytime <u>1</u> /	Limited to soils, slopes, and extra water areas as specified for range planting. Blade must run approximately 6-8 inches beneath the soil surface. Cutter blade should have 3- 4 or preferably 5-6 kickers or fins projecting upward and backward at approximately 22-degree angles from the cutter blade. Chain will be attached to each side of plow and dragged behind rootplow to flip brush out of ground. Disking should be to a depth that will pull out tarbush and creosote plants. Range seeding will follow rootplowing or disking. Disc must be set to plow out and dislodge the entire crown of all plants in the stand
	Mowing (tarbush only)	When plants are in full foliage and prior to seeding or maturity	In and out grazing with sheep and goats can be done to remove regrowth and aid in reduction of tarbush, in a system similar to that for shin oak.
Huisache & Retama Invaders in grasslands of South Texas and the Gulf Region.	Rootplow	Anytime <u>1</u> /	This practice is most effective when performed during the summer months. When rootplowing is done during periods outside the summer months, a rake or drag should be used to pull the plants out. Stack and/or burn top growth as needed. Plow to at least a 14" depth. Rootplow blade must be equipped with kickers or fins to bring roots to surface. Fins should be attached at 22 - degree angle, not over 30" apart and long enough to project

Huisache & Retama cont.			into and move through the soil. Stands with predominantly seedling huisache or retama, may be plowed to an 8 to 10" deep.
	Power grub (tree doze) Power grub (tree doze) cont.	Anytime 1/	Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Applicable when stems are 3" or more in diameter at breast height (dbh). Apply only when soil has good moisture to a depth of at least 12". Stack and/or burn top growth as needed. Grub to at least a 14" depth. Trees must be uprooted below the bud zone. This is best accomplished with a "stinger". Flat blades are not acceptable. Corners of blades are not as desirable as "stingers" and will destroy the seed source of desirable grass species.
Juniper – Ashe (blueberry), Eastern Red cedar. Ashe juniper is common on limestone soils of Central Texas. Eastern redcedar occurs on sandy soils of central and East Texas	Chain one way	Anytime	Applicable where juniper is the dominant species. The ground must be moist to give effective control. Reapply chaining in opposite direction 30 months or later as needed. Use heavy naval chain. Sprouts or seedlings must be controlled by goats, chemicals, or fire.
	Axe, saw, power grubbing or tree dozing and power equipment such as hydro-axe or shears	Anytime	Removal all green growth and aboveground foliage are essential for control. Power grubbing will be necessary when ashe juniper is mixed with redberry juniper to ensure proper treatment. Very effective techniques to be used on these non re-sprouting species.
	Chaining two ways (opposite direction)	Anytime	Applicable where juniper is so thick that two-way chaining is needed to obtain adequate initial control (dense stands)
	Axe, saw, and power equipment such as hydro-axe or shears	Anytime	Removal all green growth and aboveground foliage are essential for control. Very effective techniques to be used on these non re-sprouting species
	Cable	Anytime	Use 2 strands of cable. One strand should be about 1/3 longer than the other should. Applicable to stands where 75% of the cedar exceeds 4' height and less than 15% crown canopy exists.
	Rootplow	Anytime 1/	Stack and/or burn top growth as needed. Plow to at least an 8 to 10" deep. Rootplow blades must be equipped with fins attached at 22 - degree angle, not over 30" apart to bring roots to the surface.
Juniper (Redberry) Common to rocky soils of	Power grubbing (tree dozing)	Anytime 1/	Trees must be uprooted below the bud zone. This is best accomplished with a "stinger". Flat blades are not acceptable. Corners of blades are not as desirable as "stingers" and will destroy the seed source of desirable grass species.

Western Texas	Chaining	Anytime 1/	Chaining is applicable with good soil moisture. Sprouts must be controlled by goats, chemicals, or fire.
McCartney Rose Invader in Gulf Coast and Southeast Texas	Railing	Anytime	Railing is most applicable on rose hedge that is too large to get an effective herbicidal treatment due to poor coverage. Railing is used to manipulate plants to get them in a condition to get an effective control with recommended herbicidal rates. This practice should not be used as a stand-alone practice. This practice should be followed up using prescribed burning and/or recommended herbicide control.
Mesquite Common to most of Texas	Chain	Anytime, soil moisture is adequate	Applicable to tree-type (single stem) mesquite with at least 75% of trunks 8" or more diameter. Apply only when soil has good moisture to a depth of at least 12". Chain two ways. Use naval chain within minimum weight of 50 lbs. per link. Chaining is only applicable where the brush is such that it requires additional treatment prior to rootplowing to remove heavy brush. This practice is not to be used as a stand-alone practice. This practice may spread prickly pear.
	Rootplow	Anytime 1/	Stack and/or burn top growth as needed. Low to at least a 14" depth. Rootplow blades must be equipped with fins to bring roots to the surface. Fins should be attached at a 22-degree angle, not over 30" apart, and be long enough to project through the soil. If the stand is dominantly seedling mesquite, plow 8" to 10" deep. All treatments must uproot trees below the bud zone.
	Power grubbing (treedozing, low-energy grubbing, hand grubbing, excavator)	Anytime 1/	Accomplish in a manner that assures complete removal of bud zone from the soil. Treedozing usually adapted to single stemmed plants or small motts. Stack and/or burn top growth as needed. Extract with a "stinger" below the bud zone. Flat blading is not accepted. Corners of blades are not as desirable as "stingers" as they may destroy the seed source of desirable plants. Sprouts should be controlled with chemical or mechanical Individual Plant Treatment (IPT).
Persimmon, Texas South and Southwest Texas, often in rocky soils.	Hand grub, power grubbing	Anytime	Individual plant treatment must be carried out and a thorough job of uprooting the plant must be done to avoid reporting. Sprouts must be controlled by goats, shredding, chemicals, or fire.
Pricklypear, tasajillo and cholla	Grubbing, piling pricklypear, cholla, tasajillo	Anytime	Sever the plant 2" to 4" below ground. Must remove entire crown. Do not leave pads or joints scattered on ground. Stack and control new plants.
Saltcedar Common invader on all	Rootplow	June 1/ July August	Plow at least 12" deep. Rootplow must be equipped with kickers or fins spaced 30" apart; 30" long, and connected at the blade at a 22-degree angle. Root rake as needed to remove all roots.

watercourses, wet areas in West and Central Texas	Power grub (tree doze)	Anytime	Trees must be uprooted below the bud zone. This is best accomplished with a “stinger”. Flat blades are not acceptable. Corners of blades are not as desirable as “stingers” and will destroy the seed source of desirable grass species.
Shin oak (<i>Quercus harvardii</i>) Common on sands of West and NW Texas and on rocky soils in the Hill Country, Edwards Plateau, and Grand Prairie	Deep plowing or rootplowing	Winter or summer <u>1/</u>	Not applicable on dune or blowout areas. Plow 20” to 30” deep on sandy soils where there is no sandy clay loam, clay loam, or gravelly base. Plow 10 to 20” deep on sandy soils with sandy clay loam base, but do not exceed a plow slice of 1/3 of the clay loam or sandy clay loam materials. Follow-up to control resprouts. Rootplow at least 18” deep. Blades must be equipped with fins or kickers not over 30” apart and long enough to extend through the soil.
Whitebrush (Beebrush) Common on valley, and deep soils of South Texas and South- central Texas	Offset disk plow	Anytime <u>1/</u>	Disk twice. The disk must be 30” in diameter. The area should be plowed at sufficient depth to cut the whitebrush below the bud zone. The second disking shall be done 2-4 months after the initial operation and at right angles to the first disking. This practice should not be used on rocky or gravelly soils.
	Rootplowing	Anytime <u>1/</u>	Stack or burn top growth as needed. Plow to sufficient depth to cut the dominant brush plants below the crown or bud zone. The plow should be equipped with fins spaced not over 30” apart, which will bring the plant roots to the surface. Sprouts must be controlled by goats, chemicals, or fire.
	power grubbing (tree doze), hand grubbing,		Accomplish in a manner that assures complete removal of bud zone from the soil. Adaptive for larger plants, scattered and in motts. Stack and burn top growth as needed.
	Chaining, shred, roller chop		Adapted only for knocking down plants so that goats can reach leaves, or as a temporary control requiring repeated treatment. Effective as a component practice to a brush management system.

1/ Seeding or sprigging will be done during the current or next applicable date. Ground-disturbing methods are best in fall or early winter if seeding is planned for next spring.

ATTACHMENT II

Chemical Brush Management

Chemical Recommendations

Follow the recommendations found in Chemical Weed and Brush Control, Suggestions for Rangeland Publication ERM-1466. This product is available in both hard copy and electronic copy. Please refer to the electronic copy for the most up to date product. The electronic PESTMAN Chemical publication ERM-1466 can be found on the following web site <http://cnrit.tamu.edu> or <http://pestman.tamu.edu> NRCS does not originate specific instructions, specifications, formulations, or recommendations regarding herbicides. NRCS employees can only recommend herbicides that are listed in ERM-1466, or are noted in approved supplements to the brush management standard and specification.

If there is a discrepancy between recommendations in ERM-1466 and PESTMAN, ERM-1466 will be followed.

For Forestry applications, see 490 Tree and Shrub Site Preparation Job Sheet 11a for a list of herbicides identified for site preparation activities. Always read and follow label directions. Herbicide recommendations should be provided by licensed professionals, Texas A&M Forest Service personnel, consulting foresters or Texas A&M AgriLife Extension personnel. Documentation should be provided showing the person or agency that made the herbicide recommendation.

Applications of certain herbicides may negatively impact desirable forbs and woody species that are essential to wildlife habitat. Special precautions must be taken to preserve habitat when herbicides are used. Wildlife management options should be discussed with landowners before herbicide use is planned.

Individual Plant Treatment

Where herbicides are used following mechanical control measures, treatment will be delayed until adequate top growth has occurred to assure translocation of the herbicide.

- 1) Individual Plant Treatment (IPT) has proven to be cost effective and much more effective than most broadcast treatments.
- 2) Conservationists must consider the type of targeted species when selecting herbicidal IPT. IPT basal treatments are most feasible on plants with 1-2 basal stems. IPT foliar treatments are most feasible on multiple stemmed plants less than 8 feet tall.
- 3) Plant densities in terms of plants/acre rather than crown canopy should be used when determining whether or not to use IPT. As a general rule of thumb, densities of greater than 300 plants per acre should be controlled by means other than IPT. Plant size also influences the feasibility and cost of IPT.
- 4) Methods of determining density of targeted species include:
 - Belt-transect method. A simple method for conducting a belt transect is to use a 10-foot long piece of PVC pipe. Walk along a pre-determined path for 436 feet counting all target species that root under the width of the pipe, and multiply the number of species counted by ten which will provide the plant density in plants per acre.
 - Expanded Plot method is to use one-hundredth of an acre (21' x 21') or one-tenth of an acre (66' x 66') plots to determine density by counting the number of target plants rooted inside the plots and multiplying by the appropriate value.
 - Several plots or belt transects will usually be needed in each pasture to determine average density.
- 5) Research indicates that substantially less herbicide may be needed per acre when using IPT as opposed to standard broadcast methods. This makes IPT an environmentally sound choice as well as a more economically sound one.
- 6) IPT has broadened the application window considerably. Low volume basal treatments can be applied anytime during the year. Foliar sprays often can be applied for several months during the year and foliar sprays often can be applied during most of the growing season.

Suppression of Mesquite

This is guidance for suppression spraying of mesquite when the emergence of nearby susceptible crops or the Texas Department of Agriculture's "Restricted Areas for the Application of Hormone Type Pesticides" precludes spraying prior to soil temperatures reaching 75 degrees at the 12-inch depth. This treatment is for broadcast applications.

If spraying is stopped, mesquite will resume pre-treatment levels as a multi-stem growth form within a couple of years. This method of treatment results in a low kill rate of mesquite. Refer to RM-1466, Chemical Weed and Brush Control Suggestions for Rangeland for the recommended herbicide mixtures and volumes.

This brush management system will require three (3) applications over a seven (7) year period in order to achieve initial canopy reduction. Once the desired plant community is established, a management program consisting of proper stocking rates will be needed to maintain plant health and vigor. Spray the area often enough to maintain approximately a 10% canopy of mesquite. Prescribed burning may be used to maintain the desired plant community as well as to burn down standing dead trunks. Application alternatives will vary depending on wildlife objectives and the use of alternative brush management techniques such as prescribed fire.

The following choices are available in the application of this method:

1. Apply once each year for three years to gain initial suppress of mesquite. Thereafter, spray only once every 3 - 4 years to maintain approximately a 10% canopy, or
2. Apply the treatment once every 2 - 4 years to maintain approximately a 10% canopy. This treatment will result in less reduction of broadleaf forbs that may be important to clients with stronger wildlife objectives, or
3. Apply three (3) applications within a seven (7) year period on a discretionary basis keyed off the landowner's objectives and the results of the prior spraying.

Attachment III Biological Brush Management

Use livestock for follow-up treatment after chaining, dozing, chopping, prescribed burning, shredding, or for initially controlling oak. The use of livestock is never the primary brush treatment unless the brush is already accessible for control by livestock. 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 livestock can be concentrated on for sufficient defoliation.

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

1) Priority Pastures

Choose two pastures to rotate livestock between and assign one first priority and the other second priority. Sufficient livestock 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 biological control when leaves are fully developed in late April or early May. Place the livestock in the first priority pasture at the rate needed and as often as necessary to maintain at least 85 percent defoliation. When the livestock are not in the first priority pasture, they will be placed in the pasture with second priority. Maintain this rotation for the full growing season. It is desirable to 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. In the beginning, it is recommended that at least a prior fall deferment be made with no winter grazing on the pasture to be mechanically treated and biologically controlled the following growing season.

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 livestock 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 livestock - resulting in at least 3 months of rest each growing season. A minimum of 3 years of biological control is generally needed to obtain desired control. It is desirable to defer the pasture 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.

APPROVAL AND CERTIFICATION

**BRUSH MANAGEMENT
(AC)**

CODE 314

PRACTICE SPECIFICATIONS APPROVED:

/s/ Charles L Kneuper
State Range Management Specialist

July 18, 2017

Date

/s/ Kristy Oates
State Resource Conservationist

July 18, 2017

Date

Reviewed By:
Zone Rangeland Management Specialists
State Office Specialists

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