

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATIONS:
BRUSH MANAGEMENT (acre)**

Code 314

POPULATION BY SPECIES

TABLE 1

On some ecological sites, some of these species may be part of the reference state plant community. Refer to the corresponding Ecological Site Description when designing treatments.

*Species	Percent Canopy Cover			Plants Per Acre				Type of transects
	Dense	Medium	Light	Extra Heavy	Dense	Medium	Light	
Algerita	Over 26	15-25	5-14					Canopy Cover Intercept
Broom snakeweed	Over 20	5-20	Less than 5					Canopy Cover Intercept
Catclaw					over 200	100-199	99 or less	Belt Transect or 1/10th acre square or circle plot
Cholla/Tasajilla					over 250	130-250	129 or less	Belt Transect or 1/10th acre square or circle plot
Creosotebush					over 250	130-249	129 or less	Belt Transect or 1/10th acre square or circle plot
Ponderosa/Mixed Conifer**					over 800	300 – 800	300 or less	1/10 th acre plots totaling at least ½ acre in size or zig-zag transect
Juniper or Pinon**				Over 350	250	100-249	99 or less	1/10 th acre plots totaling at least ½ acre in size or zig-zag transect
Mesquite	Over 25	10-24	5-9					Canopy Cover Intercept

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*Species	Percent Canopy Cover			Plants Per Acre				Type of transects
	Dense	Medium	Light	Extra Heavy	Dense	Medium	Light	
Pricklypear *** Yucca					over 250	130-250	129 or less	Belt Transect or 1/10th acre square or circle plot
Rabbitbrush	Over 35	15-34	5-14					Canopy Cover Intercept
Sagebrush (Sand)	Over 35	20-34	5-19					Canopy Cover Intercept
Sagebrush (Big)	Over 35	20-34	5-19					Canopy Cover Intercept
Shinnery Oak	Over 26	15-25	5-14					Canopy Cover Intercept
Shrub Oak ***	Over 30	15-29	5-14					Canopy Cover Intercept
Tarbush					Over 300	130-299	129 or less	Belt Transect or 1/10th acre square or circle plot
Salt cedar*	Over 30	10-30	Less than 10					Canopy Cover Intercept

* Considered noxious on the NMDA list

**Not applicable on forest and/or woodland sites.

***Plants are counted as: 1 mot is one plant for Pricklypear and Shrub oak.

SPECIFICATIONS

Table 2

Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide for New Mexico Rangelands" CR 597 http://aces.nmsu.edu/pubs/_circulars/CR597/.

Electrostatic application requirement for water will follow the herbicide label or supplemental label of the product. In most cases, 1-2 gpa water is needed with variations based on charge of droplet required, the rate of herbicide and application equipment used.

Where target species are shrubs, trees or succulents, or where treatments are mentioned in the CR_597, that do not appear in the specifications below, NRCS employees can advise clients to use those treatments. Any mention of a trade name in this specification is for reference purposes only and is not an endorsement by NRCS of said product.

Prior to application, any recommended deviations from the Guide or this specification are to be submitted to the Assistant State Conservationist for Technical Services (SRC) for review, concurrence and authorization. SRC concurrence and authorization is to be made in writing and made part of the project Implementation Requirements (Job sheet). Any recommended deviations submitted to the SRC must be made by a New Mexico certified public applicator.

***Reduced Rate Treatments for Creosotebush, Tarbush, Big Sage and/or Shinnery Oak:**

The following specifications for reduced rate aerial application of tebuthiuron will only be used for Big Sagebrush, Creosote and Tarbush when objectives include brush management for Wildlife. Treatment must address specific habitat deficiencies as documented on Wildlife Habitat Evaluation Guide Sheets for species of concern. Reduced rates for control of all other brush species must have ASTC/Technical Services Variance/Approval.

Plant Name: Creosotebush (*Larrea tridentata*) and/or Tarbush/Blackbrush (*Flourensia cernua*) and/or Big Sage (*Artemisia tridentata*) and/or Shinnery Oak (*Quercus havardii*) - Reduced Rate Recommendations (For other treatment recommendations look further into this specification)

SPECIES	METHODS	TIME	MATERIALS	TECHNIQUES OF OPERATIONS
Creosote and/or Tarbush and/or Shin Oak Recommendation; Reduced rate Application for Partial Control of Big Sagebrush, Creosotebush, Sand shinnery Oak and tarbush.	Aerial	Prior to Rainy Season	Tebuthiuron	Reduced Rate: 0.3 to 0.75 lb active ingredient/acre of 20P formulation on the following soils: sandy loams, fine sandy loam, very fine sandy loam, loam, silt, silt loam, loamy sand, loamy fine sand, loamy very fine sand, sands, fine sand and very fine sand. Wildlife management goals and objectives and expected percent kill of target species must be documented in brush management plan. Apply on medium to dense stands having grassland potential. WinPST and 595 Integrated Pest Management runs must be completed.
Big Sagebrush Spike 20P EPA Reg. No. 62719-121 Special 2(ee) Recommendation; Reduced rate Application for Partial Control of Big Sagebrush, Creosotebush, Sand shinnery Oak and tarbush.	Aerial	Prior to Rainy Season Late summer or fall.	Tebuthiuron	Reduced Rate: 0.3-less than 0.5 lb. active ingredient/acre of 20P formulation on the following soils: sandy loams, fine sandy loam, very fine sandy loam, loam, silt, silt loam, loamy sand, loamy fine sand, loamy very fine sand, sand, fine sand, very fine sand, cama silty loam, and sandy clay loam. Wildlife Management goals, objectives and expected percent kill of target species must be documented in the brush management plan. Apply on medium to dense canopy having grassland potential. Plant kill may require two growing seasons or more. Areas of high clay soils tend to have a lower kill rate of target plants when tebuthiuron is used. Where grey rabbitbrush occurs in stands of big sage be aware that special care will be needed to keep rabbit brush from dominating the site post treatment. WinPST and 595 Integrated Pest Management runs must be completed.

SPECIFICATIONS

Table 2

Plant Name: Mesquite (*Prosopis spp.*) AND Cactus – Prickly Pear, dog cactus and other species of cacti (*Opuntia spp.*) and/or Cholla Cactus (*Opuntia imbricata* and other *Cholla spp.*) Mixed Species Treatment Recommendation (For other single species treatment recommendations look further into this specification)

SPECIES	METHODS	TIME	MATERIALS	TECHNIQUES OF OPERATIONS
Intermixed stands of Mesquite AND Cholla and/or Prickly pear Reference NMSU 597 Circular: http://aces.nmsu.edu/pubs/_circul ars/CR597/	Aerial	Prior to Rainy Season Normal mesquite aerial spray season. Use <i>Checklist to Determine Mesquite Condition for Effective Herbicide Control</i> . https://efotg.sc.egov.usda.gov/references/public/NM/314js-mesquite_cklist.doc	Sendero + Surmount**	28 oz Sendero + 1 to 2 qt. Surmount mixed in 2–4 gal oil-in-water emulsion as aerial spray. (1 pt to 1 qt diesel fuel oil (only private lands) and water to make 2–4 gal/acre). Note: When treatment is on Federal Land, check with Federal Land Management agency to determine acceptable surfactants. (Diesel fuel is not currently allowed). Apply according to label. WinPST and 595 Integrated Pest Management runs must be completed.

**Use of these trade names is not an endorsement of the product by NRCS. They are used here to aid the user in identifying proper rates of application.

Plant Name: Big Sagebrush (*Artemisia tridentata*)

Treatment Method	Where Applicable	When Applicable	Remarks
<u>Mechanical</u> <u>1. Shredding or mowing:</u> Removal of top growth accomplished by shredding or beating or mowing the top growth so that all the twigs or branches are removed to within 4" or less of the ground surface.	Limited to mature even age stands in areas with good under story vegetation and no rabbitbrush or rockbrush.	When big sage has reached full leaf, generally from May 15 to September 15.	Removal of top growth will be necessary in consecutive years to complete the practice, as determined by the cooperator and the conservationist.
<u>2. Plowing:</u> Brushland plow or similar equipment. Cut in a manner to sever plants at least 4" below ground level. Any other equipment, which will ensure 90% reduction, is acceptable.	All stands where a good under story of desirable grasses does not exist and areas relatively free of stones (plow-able soils)	Early spring or fall prior to seeding date to assure kill and firm seed bed	Seeding is required as a follow-up measure Brush reduction should be timed with range planting. Practice applications are limited to <10 % slopes unless no erosion hazard exists.

Continued: Big Sagebrush (<i>Artemisia tridentata</i>)			
3. Chopping/Roller Chopping: (Marden or Fleco Brush Chopper or Larson Aerator)	Stony areas where sagebrush is mature, brittle and free of young sagebrush plants and rabbitbrush.	Late winter- December 1- February 28	Single drums require two passes in opposite directions.
4. Chaining: In two directions (opposite) with chain at least 70#/ft. Preferably 2 or 3 chains with roller hitch speed of crawler tractor at least 3 mph.	Limited to areas of mature stands with good understory of desirable vegetation and relatively level land.	Winter and early spring before frost departs the soil	
Chemical 1. Aerial application: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR597/	Areas of mature Big Sagebrush with good understory of desirable vegetation.	Summer or fall in anticipation of rainfall.	Herbicide may kill or damage pinyon, juniper, & ponderosa pine trees scattered throughout the sagebrush, caution may need to be exercised to avoid them. DO NOT APPLY WHEN THERE IS SNOW ON THE SOIL OR SOIL IS SATURATED. Rabbitbrush will not be controlled by herbicide and may replace sagebrush after treatment. Plant kill may require two growing seasons or more. Areas of high clay soils tend to have a lower kill rate of target plants when tebuthiuron is used. WinPST and 595 Integrated Pest Management runs must be completed.

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Plant Name: Broom Snakeweed (*Gutierrezia sarothrae*)

Treatment Method	Where Applicable	When Applicable	Remarks
<p>Chemical</p> <p>1. Application by Aerial or Ground Equipment: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR597/</p>	<p>On heavily infested ranges where grazing management will not reduce the infestation by plant succession in a reasonable time.</p>	<p>In fall (October to end of November optimum) at late to post bloom plant stage. Soil temperatures at 6 inches should be between 50 and 70 degrees F.</p>	<p>Longevity of treatment may not exceed three years.</p> <p>Reference: "Broom Snakeweed Response to Herbicides." Ag. Exp. Bulletin #706 - Kirk McDaniels http://contentdm.nmsu.edu/cdm/ref/collection/AgCir/cs/id/28140 Snakeweed: "Problems and Perspectives" NMSU Bulletin #75. Reference: "Control Perennial Snakeweed" NMSU Guide B-815 http://aces.nmsu.edu/pubs/_b/B815/welcome.html Reference: "Snakeweed Control: Aerial Application" NMSU Brush Control Brochure BC-4 http://aces.nmsu.edu/pubs/_b/B824/welcome.html WinPST and 595 Integrated Pest Management runs must be completed.</p>

Plant Name: Catclaw Mimosa (*Mimosa biuncifera*) **and Catclaw Acacia** (*Acacia greggii*)

Treatment Method	Where Applicable	When Applicable	Remarks
<p>Mechanical</p> <p>1. Rootplowing: Reduction is achieved by severing the roots at least 9" below the surface. Range planting is required as a follow-up measure.</p> <p>2. Bulldozing or Excavator: The plants must be uprooted or cut off below the bud zone.</p>	<p>Medium to heavy stands</p> <p>All stands</p>	<p>Anytime, preferably in the spring or early summer before the anticipated rainy, season to coordinate with seeding.</p> <p>Anytime</p>	<p>Low production potential limits the application of this type of treatment to areas of 13" or higher rainfall.</p>

Continued: Catclaw Mimosa (<i>Mimosa biuncifera</i>) and Catclaw Acacia (<i>Acacia greggii</i>)			
3. Hand Grubbing: Plants must be cut below the bud zone. Chemical: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR597/	Light stands All stands	Anytime Anytime- optimum is during growing season when plants have mature leaves	Adapted to light stands of young plants (usually plants that do not exceed 2" at the trunk). Basal application, individual soil applied herbicides, and foliar applications are applicable means of treatment. WinPST and 595 Integrated Pest Management runs must be completed.

Plant Name: Cholla Cactus (*Opuntia imbricata* and other *Cholla* spp.)

Treatment Method	Where Applicable	When Applicable	Remarks
Mechanical 1. Rootcutting and Staking: Cut or in any manner sever the plants at least 2-4" below ground level. 2. Grubbing and Stacking: mechanically uproot cholla plants by slipping the fork under the plant and gently lift until the cactus is uprooted. The bucket should be tilted to catch as many of the broken joints as possible	Deep, rock free soils, and on areas free of light stands of pinyon- juniper. A complete total treatment should be developed on mixed brush sites.	Year long, except when soil is frozen. Best results in December & January or dry summers	Gives effective kill on all size classes. Care should be taken not to scatter broken joints. Burn dry stacks.
3. Cabling: Pulling flexible cable between two power vehicles to uproot and drag from the soil. First cable of swiveled double loop to be a minimum of one inch flexible (rope core) cable, two way cabling Second trip at 90 degree angle from the first pass. Speed will not exceed 5 m.p.h.	Applicable to dense stands of large uniform Cholla in areas without woody plants. NOTE: Limited to areas where hard freezes are followed by cold, dry weather. This treatment is appropriate to all of NM except MLRA 35 and 41 and 42.	After first hard freeze to February 28, with good soil moisture to insure plant pull without breaking off at root collar. <u>Moisture very important.</u>	Scattered joints may re-sprout.
4. Railing: Pulling a 3 rail railroad iron gang drag in a manner similar to Cabling above.	Same as Cabling above	Same as Cabling above	Same as Cabling above

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Continued: Cholla Cactus (<i>Opuntia imbricata</i> and other <i>Cholla</i> spp.)			
5. Roller Chopping: (Larson Aerator)	All stands	Late winter-December 1- February 28	Single drums require two passes in opposite directions, double drums one pass. Avoid sandy soils or adjust treatment to strips of leave and treat.
6. Hand Grubbing: Cut the main root 2-4" below the ground level and remove the plant from the area.	Light stands	Any time, except when ground is frozen or wet. Best results December to the end of January and very dry summers.	Gives good kill when properly done & joints cleaned up. Reference: "Control Cholla Cactus" NMSU Guide B-804 http://aces.nmsu.edu/pubs/_b/B804/welcome.html
Chemical: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR597/	All stands	Time of application varies by chemical selected. See CR-597 for each chemical timing requirements.	Plant kill may require two growing seasons. WinPST and 595 Integrated Pest Management runs must be completed. Reference: "Control Cholla Cactus" NMSU Guide B-804 http://aces.nmsu.edu/pubs/_b/B804/welcome.html

Plant Name: Cactus – Prickly Pear *Opuntia*, dog cactus *Grusonia grahamii*, and other species of cacti including *Tasajilla*

Treatment Method	Where Applicable	When Applicable	Remarks
<u>Mechanical:</u> 1. Hand Grubbing: Cut the main root 2-4" below the ground level and remove the plant from the area.	Light stands	Any time, except when ground is frozen or wet. Best results December to February 1 and very dry summers.	Caution should be taken to not scatter broken Cholla joints.
<u>Chemical :</u> 1. Aerial and Individual Plant Treatments (IPT) Follow the "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR597/ For each species and herbicide. Herbicide and mixtures and will be applied according to manufacturer's label.	All stands. Individual Plant Treatments may be used for light stands.	Time of application varies by species and chemical selected. See CR-597 for each chemical timing requirements.	Plant kill may require two to three growing seasons. WinPST and 595 Integrated Pest Management runs must be completed.

Continued: Cactus – Prickly Pear <i>Opuntia</i>, dog cactus <i>Grusonia grahamii</i>, and other species of cacti including <i>Tasajilla</i>			
Aerial application for treatment of Pricky Pear, Dog Cactus and Cholla with Surmount ** at 2 quarts/acre	All stands	April to June 1st, then lay off until July 15th. From July 15th to mid September. Apply in a time period where the cactus is actively growing/reproducing and when you get a chance of rain within 30-60 days	Keith Duncan e-mail of 2010-10-28 effective on Cholla and Prickly pear. Strongly recommend the addition of a petroleum based oil such as Herbimax. WinPST and 595 Integrated Pest Management runs must be completed.

Plant Name: Creosotebush (*Larrea tridentata*) and Tarbrush (*Flourensia cernua*)

Treatment Method	Where Applicable	When Applicable	Remarks
<u>Mechanical</u>			
<u>1. Discing, Rootplow:</u> Cut or in any manner sever the plants at least 4" below ground level. Rootplows should have kickers or fins not over 3' apart to bring roots to surface. Drag chain, on swivels, behind the plow increases the pull-up of plants.	Dense and medium stands where range planting is considered practical and feasible following treatment. (See Range Planting (550) Standards and Specifications if needed).	Early part of growing season or coordinated with seeding dates when seeding done in same operation. Brush reduction should be timed with range planting.	Suitable only on soils not subject to erosion.
<u>2. Grubbing:</u> Cut in any manner to sever the plants at least 4" below ground level.	Light stands	Year long	Suitable on all sites not shallow to rock or cobbly.
<u>Chemical:</u> Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR597/	Medium to dense stands having grassland potential.	Summer or fall in anticipation of rainfall.	The cost-return benefits need careful consideration. Grass response may be slow after treatment (up to 5 years). WinPST and 595 Integrated Pest Management runs must be completed.

Plant Name: Ponderosa Pine and Mixed conifer other than Pinon & Juniper. This practice not applicable to forest and/or persistent woodland sites, use CPS-666.

Treatment Method	Where Applicable	When Applicable	Remarks
<u>Mechanical</u> 1. Hand Cutting, Shearing: Cutting Ponderosa Pine and/or mixed conifer above the surface to leave stumps less than 3 to 6" (all green material must be removed). Moderate &/or heavy stands will be stacked & burned &/or burned unless other considerations, such as wildlife, justify not disposing of treated trees. Justification must be documented. Chipping/shredding or lop and scatter may be used in lieu of stacking and/or burning.	Light and medium stands.	When environmental conditions are conducive to treatment method.	If chipping and/or shredding are used in lieu of stacking, avoid excess chips on ground that will inhibit plant growth.
2. Individual tree shredding or chipping: Hydro-axe or Hydro Mower type equipment can be used to reduce the aerial portions of a stand and mulch the soil surface at the same time. Chemical or fire treatment to follow will be necessary to kill re-sprouting.	Light and medium stands.	When environmental conditions are conducive to treatment method.	A significant safety zone (over 100 meters) must be used in areas where Hydro axe is used.
3. Bulldozing or Excavator or Grubbing: Trees must be uprooted and pushed out of the ground. Stack density not to exceed more than 5 stacks per acre. Trees may be windrowed or chipped in lieu of stacking. Stack in windrows across the slope.	All stands with moderately deep and deep soils where slope does not exceed 10%.	When environmental conditions are conducive to treatment method.	Note: Competing shrubs such as oak may invade site without follow-up treatment. Conservationists should encourage the harvest of wood products to minimize waste. Stacking or windrowing is not required on sites where prescribed burning is utilized post treatment.
4. Hand Grubbing: Seedlings less than 3 feet tall.	Light to dense stands	Year long.	Stacking not required on hand grubbing of seedlings.

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Plant Name: Juniper (*Juniperous spp.*)

Treatment Method	Where Applicable	When Applicable	Remarks
<p><u>Mechanical:</u></p> <p><u>1. Hand Cutting, Shearing:</u> Cutting one seeded or Utah Juniper above the surface to leave stumps less than 3 to 6" (all green material and scales must be removed). Above ground cutting of alligator juniper (a re-sprouter) is not applicable, unless stumps are treated with an appropriate chemical. Moderate &/or heavy stands will be stacked & burned &/or burned unless other considerations, such as wildlife, justify not disposing of treated trees. Justification must be documented. Chipping may be used in lieu of stacking and/or burning. Hydro-axe or Hydro Mower type equipment can be used to reduce the aerial portions of a stand and mulch the soil surface at the same time. Chemical or fire treatment to follow will be necessary to kill re-sprouting.</p>	Light to medium stands	Year long	<p>Alligator juniper stumps must be treated with recommended herbicide as per label. If chipping or lop and scatter is used in lieu of stacking, avoid excess ground cover that will inhibit plant growth.</p> <p>Reference: "Juniper Control: Individual Plant Treatments" NMSU Brush Control Brochure BC-3 http://aces.nmsu.edu/pubs/_b/B817/welcome.html</p>
<p><u>2. Hand Grubbing:</u> Appropriate for seedlings less than 3 feet tall. Alligator and Utah Juniper must be cut below bud zone.</p>	Light to medium stands	Year long	<p>Stacking not required on hand grubbing of Juniper seedlings.</p> <p>Reference: "Juniper Control: Individual Plant Treatments" NMSU Brush Control Brochure BC-3 http://aces.nmsu.edu/pubs/_b/B817/welcome.html</p>
<p><u>3. Bulldozing or Excavator or Grubbing:</u> Trees must be uprooted and pushed out of the ground. Stack in not more than 3 stacks per acre or 5 stacks per acre where wildlife is a concern, and stand is medium to heavy. Trees may be windrowed or chipped or lop and scatter in lieu of stacking. Stack in windrows across the slope. Stacking or windrowing is not required on sites where prescribed burning will be utilized post treatment. Hydro-axe or Hydro Mower type equipment can be used to reduce the aerial portions of a stand and mulch the surface at the same time. Chemical or fire treatment to follow will be necessary to kill re-sprouting.</p>	<p>Moderately deep and deep soils where slope does not exceed 20% (If erosion may be a concern, consider other treatment methods. Clearing is not approved on areas with 25% or greater cover of competing shrubs or big sage where no follow-up treatment of competing shrubs is planned. Consider slope when contemplating fire as post treatment.</p>	Year-long except when ground is frozen 10" deep.	<p>An on-site determination must be made by the FO conservationists where sandy sites occur. NOTE: Conservationists should encourage the harvest of posts and firewood in lieu of stacking and windrowing to minimize waste. Stacking or windrowing is not required if grazing use is reduced in proportion to the area covered by downed trees. Trees should be uprooted completely. Follow Prescribed Burn (338) standards and specifications for appropriate weather conditions and fire prescriptions to accomplish post treatment with fire. Designing mechanical treatments to enhance control of Juniper with fire can be found at: http://factsheets.okstate.edu/documents/nrem-2902-cut-and-stuff-practices-for-enhanced-cedar-control-with-prescribed-fire/</p>

Continued: Plant Name: Juniper (<i>Juniperous spp.</i>)			
Treatment Method	Where Applicable	When Applicable	Remarks
4. Cabling/Chaining/With Follow-up: Chaining with a chain that weights enough to hold it close on the ground (70 lbs. per link or more). Cable at least 1&1/8 inch. Cabling/chaining will control a minimum of 70% of target species with follow-up treatment that reflects objectives. Follow-up may include prescribed burning, chemical treatments, and/or other mechanical treatments. Trees will be stacked & burned &/or burned unless other considerations, such as wildlife, justify not disposing of treated trees. Justification must be documented. Chipping may be used in lieu of stacking & burning. Dozer spacing will depend on chain/cable length, dozer size & effectiveness in meeting minimum of 70% control of target species.	Where expansion of Juniper has occurred on rangeland ecological sites with 10% or less slopes. Chaining and/or cabling is not allowed where there is a moderate or heavy infestation of Cholla cactus or where light stands of cholla may be scattered to produce a heavy infestation. Sandy soils may be treated if trees are placed in wind-rows that prevent wind erosion. NOTE: The Ecological Site Description will be the benchmark to determine excessive Juniper expansion.	Year round except when soils are wet. Recommendations: D-7 or equivalent tractors pulling a 180' to 250' cable/chain have worked well.	Note: Cabling/Chaining & follow-up treatment must meet 70% minimum control of target species.
Chemical: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR_597	Bushy multi-stemmed canopy with grassland potential sites. CAUTION: Avoid areas where possible runoff may enter water used for irrigation of susceptible broadleaf species.	Late summer and fall in anticipation of rainfall.	CAUTION: Loss of desirable shrubs and perennial forbs can be anticipated. WinPST and 595 Integrated Pest Management runs must be completed.

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Plant Name: Mesquite (*Prosopis spp.*)

Treatment Method	Where Applicable	When Applicable	Remarks
Mechanical 1. Mechanical Grubbing: Plant must be uprooted and cut off below the bud zone.	Light, medium and heavy canopy cover.	Year long, except in very dry conditions	Bud zone is usually 6 to 20 inches deep. Remove plant completely from the ground.
2. Bulldozing or Excavator: Plants must be uprooted and cut off below the bud zone. A second application by chemical or mechanical treatment is required where initial reduction is less than 70% canopy reduction.	Light and medium canopy cover	Year long, except in very dry conditions	Bulldozing includes any method of control that severs the root below the bud zone. 12-18" as a guide 12" (heavier soils), 18" (Sandy soils)
3. Root Plowing: Plants must be uprooted and cut off below the root levels minimum of 12." Range planting will be applied in conjunction with this practice.	Medium to dense canopy cover (including intermingled light canopies) on deep and moderately deep soils	Spring and fall prior to seeding date	Follow-up method includes hand grubbing, ground spraying, chemical treatment, or plant dozing.
4. Hand Grubbing: Plant must be uprooted and cut off below the bud zone.	Light stands	Year long	Bud zone is usually 6 to 20 inches deep. Remove plant completely from the ground.
Chemical 1. Aerial or Ground equipment: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR_597	Medium to dense canopy cover (including intermingled light canopies)	The preferred application time is spring to early summer, 40–90 days after bud break. Spray with minimum soil temperature of 75°F at 12–18-inch soil depth. Soil moisture should be adequate for plant growth. (In certain early season drought years with late summer rains, there is an opportunity for spraying in July and August. This occurs when summer rains provide sufficient soil moisture that allows mesquite foliage to recover from drought or other damage and develop healthy and robust leaf growth). For ground applications refer to the product label and as recommended in the "Chemical Weed and Brush Control Guide for New Mexico Rangelands" CR-597.	Follow-up method includes hand grubbing, ground spraying, or chemical treatment. Plant kill may require two growing seasons or more. Areas of high clay soils tend to have a lower kill rate of target plants when tebuthiuron is used. WinPST and 595 Integrated Pest Management runs must be completed. Reference: "Mesquite Control: Aerial Application" NMSU Brush Control Brochure BC-2 http://coronasc.nmsu.edu/brush-control.html Note: When treatment is on Federal Land, check with Federal Land Management agency to determine acceptable surfactants. (Diesel fuel is not currently allowed).

Continued: Plant Name: Plant Name: **Mesquite** (*Prosopis spp.*)

Treatment Method	Where Applicable	When Applicable	Remarks
2. Chemical: Individual Plant Treatment: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR_597	Light to medium canopy cover	Anytime between May and October while plants have healthy leaves	Apply the spray to leaves and stems until wet, but not to the point of runoff. Recommend using marker dye to avoid multi treatment of the same plants or skipping plants treated. WinPST and 595 Integrated Pest Management runs must be completed. Note: When treatment is on Federal Land, check with Federal Land Management agency to determine acceptable surfactants. (Diesel fuel is not currently allowed). Reference: "Mesquite Control: Individual Treatment" NMSU Brush Control Brochure BC-1 http://aces.nmsu.edu/pubs/_b/B822/

Plant Name: **Sand Sagebrush** (*Artemisia filifolia*)

Treatment Method	Where Applicable	When Applicable	Remarks
Mechanical: Mowing or shredding: Removal of top growth accomplished by mowing, shredding or beating the top growth so that the twigs or branches are removed within 6" or less of the ground surface. Removal of top growth must be done two consecutive years to complete the practice.	Mature even age stands with sufficient desirable understory vegetation to re-populate sites.	As per label or LPC guidance	When in Lesser Prairie-Chicken (LPC) and Sand Dune Lizard habitat refer to NRCS-NM Biology Tech note #53 for treatment criteria and directions. http://www.nm.nrcs.usda.gov/technical/tech-notes/bio/bio53.pdf
Chemical: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR_597	Mature even age stands with sufficient desirable understory vegetation to re-populate sites.	As per label or LPC guidance	When in Lesser Prairie-Chicken (LPC) and Sand Dune Lizard habitat refer to NRCS-NM Biology Tech note #53 for treatment criteria and directions. http://www.nm.nrcs.usda.gov/technical/tech-notes/bio/bio53.pdf WinPST and 595 Integrated Pest Management runs must be completed.

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Plant Name: Rubber Rabbitbrush or Chamisa (*Chrysothamnus nauseosus*)

Treatment Method	Where Applicable	When Applicable	Remarks
Mechanical 1. Rootplowing. At least 6" below surface. Range planting is required as a follow-up measure	Medium to dense canopy cover on deep to moderately deep soils	Spring and fall prior to range planting date	Follow Range Planting 550 specifications following treatment.
2. Plowing. Plow must cut or sever roots at least 6" below surface. Range planting is required as a follow-up measure.	Medium to dense canopy cover on deep to moderately deep soils	Prior to range planting date.	Two plowings required.
3. Hand Grubbing. Cut or sever plants 6" below the surface.	Light stands	Year long	Plant should be completely removed from the ground.
Chemical: Recommended herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR_597	Medium to dense canopy cover	As per label	Rabbitbrush control with herbicides is generally poor and results vary by species. WinPST and 595 Integrated Pest Management runs must be completed.

Plant Name: Shinnery Oak (*Quercus havardii*) & Shrub Oak (*Quercus gambelii* and similar spp).

Treatment Method	Where Applicable	When Applicable	Remarks
Chemical: Recommended herbicides, Chemical rates and mixtures according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide for New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR_597	Mature even age stands with sufficient desirable under story vegetation to re-populate sites. Herbicide treatments in listed species habitat must follow the guidelines within the FWS document: " Recommended Pesticide Application Protection Measures - FWS 2007.pdf "	As per label	When in Lesser Prairie-Chicken (LPC) and Sand Dune Lizard habitat refer to NRCS-NM Biology Tech note #53 for treatment criteria and directions. http://www.nm.nrcs.usda.gov/technical/tech-notes/bio/bio53.pdf WinPST and 595 Integrated Pest Management runs must be completed.

Plant Name: Saltcedar (*Tamarix spp.*)

Treatment Method	Where Applicable	When Applicable	Remarks
<u>Mechanical</u> Dozing, Root plowing, root raking piling and burning. Cut or in any manner sever the plants at least 17" below ground level . Saltcedar is an active sprouter. Saltcedar must be uprooted so that root crown is no longer in contact with soil. Debris should be piled and burned. Root plows should have kickers or fins not over 3' apart to bring roots to surface. Drag chain, on swivels, behind the plow increases the pull-up of plants. Hydro-axe or Hydro Mower type equipment can be used to reduce the aerial portions of a stand and mulch the soil surface at the same time. Chemical or fire treatment to follow will be necessary to kill re-sprouting.	Anywhere except: 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 and the FWS Biological Opinion must be used when identifying Conservation Measures for Brush Management within Southwest Willow flycatcher Riparian Habitat. https://efotg.sc.egov.usda.gov/references/public/NM/2015-F-0001_NRCS_WIFL_BO.pdf	Any time of year when soil moisture conditions permit.	Note: Saltcedar is considered a noxious and invasive species, see CPS 314 Standard general criteria for additional treatment requirements. Saltcedar should be up-rooted so that root crown is not in contact with soil. For post treatment Operation and Maintenance see Biology Tech Note 57; A Guide For Planning Riparian Treatments In New Mexico: http://www.nm.nrcs.usda.gov/technical/tech-notes/bio/riparian-bw.pdf

Plant Name: Algerita (*Mahonia trifoliolata*)

Treatment Method	Where Applicable	When Applicable	Remarks
<u>Chemical:</u> Specific approved application of the following herbicides: Velpar:** (Hexazinone) at 3 to 4 ml per 3 feet of height. Apply as an individual plant treatment directly to soil surface within the drip line. Apply any time of year except onto frozen ground or snow. Pronone Power Pellets**: (Hexazinone) at 1 pellet per 2 feet of height. Apply directly to soil surface within the drip line. Apply any time of year except onto frozen ground or into snow. Spike 20P** (Tebuthiuron) 0.25ozs. per 3 feet of height. Apply directly to soil surface within the root zone. Apply any time of year except onto frozen ground or into snow.	Anywhere Algerita has invaded or increased beyond normal range of variability in Ecological Site Description.	As per label.	CAUTION: Consideration should be given for leaving clumps of Algerita on soils where removal of the major portion of vegetation will subject sandy soils to wind erosion. Plant kill may require two growing seasons or more. Areas of high clay soils tend to have a lower kill rate of target plants when tebuthiuron is used. WinPST and 595 Integrated Pest Management runs must be completed.

**Use of these trade names is not an endorsement of the product by NRCS. They are used here to aid the user in identifying proper rates of application.

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Plant Name: Yucca (Yucca Spp.)

Treatment Method	Where Applicable	When Applicable	Remarks
Chemical: Recommended Techniques, herbicides, chemical rates and mixtures will be applied according to manufacturer's label and as recommended in "Chemical Weed & Brush Control Guide For New Mexico Rangelands" CR-597. http://aces.nmsu.edu/pubs/_circulars/CR_597	Anywhere Yucca has invaded or increased beyond normal range of variability in Ecological Site Description.	As per label.	Complete plant kills may require two growing seasons or more. Apply to every whorl, see CR-597. WinPST and 595 Integrated Pest Management runs must be completed.

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