



Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

BRUSH MANAGEMENT

CODE 314

(ac)

DEFINITION

The management or removal of woody (nonherbaceous or succulent) plants including those that are invasive and noxious.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Create the desired plant community consistent with the ecological site or a desired state within the site description
- Restore or release desired vegetative cover to protect soils, control erosion, reduce sediment, improve water quality, or enhance hydrology
- Maintain, modify, or enhance fish and wildlife habitat
- Improve forage accessibility, quality, and quantity for livestock and wildlife
- Manage fuel loads to achieve desired conditions
- Pervasive plant species are controlled to a desired level of treatment that will ultimately contribute to creation or maintenance of an ecological site description “steady state” addressing the need for forage, wildlife habitat, and/or water quality

CONDITIONS WHERE PRACTICE APPLIES

On all lands except active cropland where the removal, reduction, or manipulation of woody (nonherbaceous or succulent) plants is desired.

This practice does not apply to removal of woody vegetation by prescribed fire (use Conservation Practice Standard (CPS) Prescribed Burning (Code 338)) or removal of woody vegetation to facilitate a land-use change (use CPS Land Clearing (Code 460)).

CRITERIA

General Criteria Applicable to All Purposes

Brush management will be designed to achieve the desired plant community based on species composition, structure, density, and canopy (or foliar) 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, burning, or biological methods, either alone or in combination. When prescribed burning is used as a method, CPS Prescribed Burning (Code 338) will also be applied.

When the intent is to manage trees for silvicultural purposes, use CPS Forest Stand Improvement (Code 666).

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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NRCS, NY
March 2018

NRCS will not develop biological or chemical treatment recommendations except for biological control utilizing grazing animals. In such cases, CPS Prescribed Grazing (Code 528) is used to ensure desired results are achieved and maintained. NRCS may provide clients with acceptable biological and/or chemical control references.

In cases where there is insufficient understory vegetation to provide a seed source to result in the desired plant community, use CPS Range Planting (Code 550) or CPS Forage and Biomass Planting (Code 512) to ensure the desired results are achieved and maintained.

Follow-up treatments may be necessary to achieve objectives.

Additional Criteria for Creating the Desired Plant Community Consistent with the Ecological Site

Use applicable ecological site description (ESD) state and transition models to develop specifications that are ecologically sound and defensible. Treatments must be congruent with dynamics of the ecological site(s) and keyed to state and plant community phases that have the potential and capability to support the desired plant community. If an ESD is not available, base specifications on the best approximation of the desired plant community composition, structure, and function to support resilience.

Additional treatments are planned and will be applied to achieve effective control of pervasive plant species through reapplication.

Additional Criteria for Restoring or Releasing Desired Vegetative Cover to Protect Soils, Control Erosion, Reduce Sediment, Improve Water Quality or Enhance Hydrology

Choose a method of control that results in the least amount of soil disturbance if soil erosion potential is high and revegetation is slow or uncertain leaving the site vulnerable to long-term exposure to soil loss.

In conjunction with other conservation practices, the number, sequence, and timing of soil-disturbing operations must be managed to maintain soil loss within acceptable levels using approved erosion prediction technology.

Additional Criteria to Maintain, Modify or Enhance Fish and Wildlife Habitat

Brush management will be planned and applied in a manner to meet the habitat requirements for wildlife species of concern as determined by an approved habitat evaluation procedure.

Conduct treatments during periods of the year that accommodate reproduction and other life-cycle requirements of target wildlife and pollinator species, and in accordance with specifications developed for CPS Wetland Wildlife Habitat Management (Code 644) and CPS Upland Wildlife Habitat Management (Code 645).

Additional Criteria to Improve Forage Accessibility, Quality and Quantity for Livestock and Wildlife

Timing and sequence of brush management must be planned in coordination with specifications developed for CPS Prescribed Grazing (Code 528).

Additional Criteria for Control of Pervasive Plant Species to a Desired Level of Treatment That Will Ultimately Contribute to Creation or Maintenance of an Ecological Site Description "Steady State" Addressing the Need for Forage, Wildlife Habitat, and/or Water Quality

Additional treatments are planned and will be applied to achieve effective control of pervasive plant species through reapplication.

Additional Criteria to Manage Fuel Loads to Achieve Desired Conditions

Control undesirable woody plants in a manner that creates the desired plant community, including the desired fuel load, to reduce the risk of wildfire, and facilitate the future application of prescribed fire.

CONSIDERATIONS

Consider using CPS Integrated Pest Management (Code 595) in support of brush management.

Consider the appropriate time period for treatment. Some brush management activities can be effective when applied within a single year; others may require multiple years of treatment(s) to achieve desired objectives.

Consider impacts and consequences to obligate species (species dependent on the target woody species) when significant changes are planned to existing and adjacent plant communities.

Consider impacts to wildlife food supplies, space, nesting, and cover availability when planning the method and amount of brush management.

State-issued licenses may be required when using chemical pesticide treatments.

For air quality purposes, consider using chemical methods of brush management that minimize chemical drift and excessive chemical usage, and consider mechanical methods of brush management that minimize the entrainment of particulate matter.

PLANS AND SPECIFICATIONS

Plans and specifications for the treatment option(s) selected by the decisionmaker will be recorded for each field or management unit where brush management will be applied.

Prepare brush management plans and specifications that conform to all applicable Federal, State, and local laws. These documents will contain the following data as a minimum:

1. Goals and objectives clearly stated.
2. Pretreatment cover or density of the target plant(s) and the planned post-treatment cover or density and desired efficacy.
3. Maps, drawings, and/or narratives detailing or identifying areas to be treated, pattern of treatment (if applicable), and areas that will not be disturbed.
4. A monitoring plan that identifies what should be measured (including timing and frequency) and that documents the changes in the plant community (compare with objectives) will be implemented.

Mechanical Treatment Methods

Plans and specifications will include items 1 through 4, above, plus—

- Types of equipment and any modifications necessary to enable the equipment to adequately complete the job.
- Dates of treatment to best effect control.
- Operating instructions (if applicable).
- Techniques or procedures to be followed.

Chemical Treatment Methods

Plans and specifications will include items 1 through 4, above, plus—

- Acceptable chemical treatment references for containment and management or control of target species.
- Evaluation and interpretation of herbicide risks associated with the selected treatment(s).
- Acceptable dates or plant growth stage at application to best effect control and reduce reinvasion.
- Any special mitigation, timing considerations or other factors (such as soil texture and organic matter content) that must be considered to ensure the safest, most effective application of the

herbicide.

- Reference to product label instructions.

On organic operations, chemical treatments applied must comply with USDA's National Organic Program regulations. Landowners should consult with their certifier for product approval before purchasing and applying any treatments.

Biological Treatment Methods

Plans and specifications will include items 1 through 4, above, plus—

- Acceptable biological treatment references for containment and management or control of target species.
- Kind of grazing animal to be used, if applicable.
- Timing, frequency, 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 nontarget species.
- Special mitigation, precautions, or requirements associated with the selected treatment(s).

OPERATION AND MAINTENANCE

Operation

Brush management practices must 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 post-treatment regrowth of target species after sufficient time has passed to monitor the situation and gather reliable data. Length of evaluation periods will depend on the woody species being monitored, proximity of propagules (seeds, branches, and roots) to the site, transport mode of seeds (wind or animals), and methods and materials used.

The operator will develop a safety plan for individuals exposed to chemicals, including telephone numbers and addresses of emergency treatment centers and the telephone number for the nearest poison control center. The National Pesticide Information Center (NPIC) telephone number in Corvallis, Oregon, may also be given for nonemergency information: **1-800-858-7384**, Monday to Friday, 6:30 a.m. to 4:30 p.m. Pacific Time. The national Chemical Transportation Emergency Center (CHEMTRAC) telephone number is **1-800-424-9300**.

- Follow label requirements for mixing/loading setbacks from wells, intermittent streams and rivers, natural or impounded ponds and lakes, and reservoirs.
- Post signs, according to label directions and/or Federal, State, Tribal, and local laws, around fields that have been treated. Follow restricted entry intervals.
- Dispose of herbicides and herbicide containers in accordance with label directions and adhere to Federal, State, Tribal, and local regulations.
- Read and follow label directions and maintain appropriate Material Safety Data Sheets (MSDS). MSDS and pesticide labels may be accessed on the Internet at: <http://www.greenbook.net/>.
- Calibrate application equipment according to recommendations before each seasonal use and with each major chemical and site change.
- Replace worn nozzle tips, cracked hoses, and faulty gauges on spray equipment.
- Maintain records of brush/shrub control for at least 2 years. Herbicide application records shall be in accordance with USDA Agricultural Marketing Service's Pesticide Recordkeeping Program and State-specific requirements.

Maintenance

Following initial application, some regrowth, resprouting, or reoccurrence of brush may be expected. Spot treatment of individual plants or areas needing retreatment should be completed as needed while woody vegetation is small and most vulnerable to desired treatment procedures.

Review and update the plan periodically in order to—

- Incorporate new integrated pest management technology.
- Respond to grazing management and complex plant population changes.
- Avoid the development of plant resistance to herbicide chemicals.

REFERENCES

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Natural Resources Conservation Service
CONSERVATION PRACTICE STANDARD
HERBACEOUS WEED TREATMENT

CODE 315

(ac)

DEFINITION

The removal or control of herbaceous weeds including invasive, noxious, prohibited, or undesirable plants.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Enhance accessibility, quantity, and/or quality of forage and/or browse
- Restore or release native or desired plant communities for wildlife habitat
- Protect soils and control erosion
- Reduce fine fuel loads and wildfire hazard
- Control pervasive plant species to a desired level of treatment

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on all lands except active cropland where removal, reduction, or manipulation of herbaceous vegetation is desired.

This practice does not apply to removal of herbaceous vegetation for a land use change or by prescribed fire. Refer to NRCS Conservation Practice Standards (CPSs) Land Clearing (Code 460) or Prescribed Burning (Code 338), respectively.

CRITERIA

General Criteria Applicable to All Purposes

Apply herbaceous weed treatment to achieve the desired control of the target species and protection or enhancement of desired species. Desired species contribute positively to land use objectives and site potential. Use mechanical, chemical, or biological methods either alone or in combination.

Control pervasive and undesirable herbaceous vegetation to the desired level of treatment that contributes to the desired state of an ecological site.

NRCS will not develop insect biological control recommendations or chemical treatment recommendations.

NRCS can provide clients with acceptable biological and/or chemical control references to achieve desired management objectives.

NRCS can provide recommendations for biological control to manage herbaceous weeds utilizing grazing animals. Use NRCS CPS Prescribed Grazing (Code 528) to ensure desired results are achieved and maintained.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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NRCS, NY
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Nonchemical weed management techniques such as mowing, manually removing, or spot-flaming infestations can be effective.

When using herbicides, follow all environmental hazards and site-specific application criteria listed on herbicide labels and contained in extension service and other approved pest management references. Access the most recent herbicide labels at the Greenbook Web site (<http://www.greenbook.net>).

Include post-treatment measures to achieve resource management objectives.

Control livestock and human access based on management methods applied and restrictions listed on the herbicide labels.

Manage and/or dispose of treated weed species that prevents the spread of herbaceous weeds to new sites.

When the herbaceous weed treatment of undesirable species results in the need to reestablish desired herbaceous species, follow details in the appropriate vegetation establishment practices such as NRCS CPSs Pasture and Hay Planting (Code 512), Cover Crop (Code 340), Conservation Cover (Code 327), Range Planting (Code 550), Critical Area Planting (Code 342), Tree /Shrub Establishment (Code 612), or Wildlife Habitat Planting (Code 420).

Incorporate weed prevention strategies that include—

- Minimizing soil disturbance.
- Minimizing movement of equipment through weed infested areas.
- Inspecting and cleaning equipment to prevent spread of undesired vegetation.

Apply treatments during periods of the year when weed species are most vulnerable and when restoration of the native or desired plant communities have the best chance of recovery.

Adjacent land uses must be considered before chemicals are used. Also consider the residual effects of chemical use. Follow label and State guidelines on setbacks and other precautions from sensitive areas and surface water bodies or karst topography.

Additional Criteria to Enhance Accessibility, Quantity, and Quality of Forage and/or Browse

Apply herbaceous weed treatments that minimize negative impacts to forages and/or other nontargeted plants. Plan timing and sequence of treatment in coordination with specifications developed for NRCS CPS Prescribed Grazing (Code 528) or Forage Harvest Management (Code 511).

Additional Criteria to Restore or Release Native or Desired Plant Communities for Wildlife Habitat

Apply herbaceous weed treatments that protect the health and vigor of native or desired plant species to preserve and enhance habitat for pollinator insects and wildlife. Time treatments to periods of the year that accommodate reproduction and other life cycle requirements of target wildlife and pollinator species. Select treatments that maintain or enhance plant community composition and structure to meet the requirements of target wildlife and pollinator species.

Use applicable ecological site description (ESD) state and transition models, or other suitable information, to develop specifications that are ecologically sound and defensible. Treatments must be congruent with dynamics of the ecological site(s) and keyed to states and plant community phases that have the potential and capability to support the desired plant community. If an ESD is not available, base specifications on the best approximation of the desired plant community composition, structure, and function.

Use native vegetation to preserve and enhance pollinator insects as well as wildlife.

Additional Criteria to Protect Soils and Control Erosion

Herbaceous weed species shade out desired plants exposing more soil for potential erosion. Use caution when applying herbaceous weed treatments to minimize soil disturbance and soil erosion.

Apply additional treatments to protect soils and prevent erosion.

Additional Criteria to Reduce Fine Fuel Loads and Wildfire Hazard

Treat weed species to create a native or desired plant community that reduces the potential for accumulating excessive fuel loads and wildfire hazards.

Apply treatment methods that minimize the potential for unintended impacts to air resources (e.g., dust, chemical drift, etc.) that could also damage or kill plants, thereby contributing to wildfire hazard.

Additional Criteria to Control Pervasive Plant Species to a Desired Level of Treatment

When specific pervasive plant species cannot be controlled with one treatment, plan and apply additional treatments to achieve effective control through reapplication which may be more than once per growing season or multiple years.

CONSIDERATIONS

Consider using NRCS CPS Pest Management Conservation System (Code 595) in support of herbaceous weed treatment.

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

Consider the appropriate time period for treatment. Some herbaceous weed treatment activities can be effective when applied within a single year; others may require multiple years of treatments to achieve desired objectives.

Consider impacts to wildlife species. In general, weed treatments that create a mosaic pattern may be the most desirable. Leaving native grasses, forbs, and woody vegetation encourages a higher variety of wildlife and pollinators. When using selective herbicides, leaving other desired plant species also benefits wildlife and pollinators.

Consider impacts to wildlife food supplies, space, and cover availability when planning the method and amount of herbaceous weed treatment.

State-issued licenses may be required when using chemical pesticide treatments.

For air quality purposes, consider using chemical methods of herbaceous weed treatment that minimize chemical drift and excessive chemical usage. Consider mechanical methods of herbaceous weed treatment that minimize the entrainment of particulate matter.

Design and execute a plan using adaptive management to apply knowledge gained from earlier treatment applications.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for each field or treatment unit according to the criteria included in this standard. At a minimum, the herbaceous weed treatment management practice plan shall include—

- Goals and objectives statement.
- Plan map and soil map for the site.
- Pretreatment cover or density of the target plants and the planned post-treatment cover or density.
- Maps, drawings, and/or narratives detailing or identifying areas to be treated, pattern of treatment (if

- applicable), and areas that will not be disturbed.
- A monitoring plan that identifies what shall be measured (including timing and frequency) and the changes in the plant community (compare with objectives) that occur.
 - Appropriate revegetation conservation practice standard(s) needed following treatment (if applicable).
 - For mechanical treatment methods, the first six bulleted items above, plus—
 - Type of equipment to use for management.
 - Dates of treatment for effective management.
 - Operating instructions (if applicable).
 - Techniques and procedures to be followed.
 - For chemical treatment methods, the first six bulleted items above, plus—
 - Acceptable chemical treatment references for containment and management of target species.
 - Documented techniques to be used, planned dates, and rates of application.
 - Evaluation and interpretation narrative of herbicide risks associated with the selected treatment(s) using Windows Pesticide Screening Tool (WIN-PST) or other approved tools.
 - Consideration of any special mitigation, timing, or other factors (such as soil texture, distance to water, and organic matter content) to ensure the safest, most effective application of the herbicide.
 - Reference product label instructions.
 - Restricted use herbicide recommendations must be applied by a NYS-DEC certified pest applicator. Herbicides must be labeled for use in New York State.
 - For biological treatments methods, the first six bulleted items above, plus—
 - Acceptable biological treatment references for the selected biological control livestock used to contain and manage the target species.
 - Documentation of release date, kind, and number of livestock.
 - Timing, frequency, duration, and intensity of grazing or browsing.
 - Desired degree of grazing or browsing use for effective management of target species.
 - Maximum allowable degree of use on desirable nontarget species.
 - Special mitigation, precautions, or requirements associated with the selected treatment(s).

OPERATION AND MAINTENANCE

Operation

Herbaceous weed treatment methods shall be applied using approved materials and procedures. Operations will comply with all local, State, Tribal, and Federal laws and ordinances. The landowner is responsible for obtaining any permits prior to practice implementation. Observe State and Federal restricted-use pesticides and certified pesticide applicator's license requirements.

Develop a safety plan for individuals exposed to chemicals, including telephone numbers and addresses of emergency treatment centers and the telephone number for the nearest poison control center.

The National Pesticide Information Center (NPIC) telephone number in Corvallis, OR, may also be given for nonemergency information: 1-800-858-7384, Monday to Friday, 6:30 a.m. to 4:30 p.m., Pacific Time. The national Chemical Transportation Emergency Center (CHEMTRAC) telephone number is: 1-800-424-9300.

- Follow label requirements for mixing/loading setbacks from wells, intermittent streams and rivers, natural or impounded ponds and lakes, and reservoirs.
- Post signs according to label directions and/or Federal, State, Tribal, and local laws, around fields that have been treated. Follow restricted entry intervals.
- Dispose of herbicide and herbicide containers in accordance with label directions and adhere to Federal, State, Tribal, and local regulations.
- Read and follow label directions and maintain appropriate safety data sheets. Safety data sheets and herbicide labels can be accessed at the Greenbook Web site (<http://www.greenbook.net>).
- Calibrate application equipment according to recommendations before each seasonal use and with each major chemical and site change.
- Replace worn nozzle tips, cracked hoses, and faulty gauges on spray equipment.
- Maintain records of plant management for at least 2 years. Herbicide application records shall be in accordance with USDA Agricultural Marketing Service's Pesticide Recordkeeping Program and State-specific requirements.

Maintenance

Success of the practice shall be determined by evaluating regrowth or reoccurrence of target and desired species after sufficient time has passed to monitor the vegetation and gather reliable data. Length of evaluation periods depend on the herbaceous weed species being monitored, proximity of propagules (seeds, plant materials, and roots) to the site, transport mode of seeds (wind or animals), and methods and materials used.

Following initial application, regrowth, resprouting, or reoccurrence of herbaceous weeds can be expected. Complete spot treatments of individual plants or areas needing retreatment when weed vegetation is most vulnerable to desired treatment procedures.

Review and update the herbaceous weed treatment plan periodically to—

- Incorporate new integrated pest management technology,
- Respond to grazing management and complex weed population changes, and
- Follow cooperative extension service guidance to avoid the development of weed resistance to herbicide chemicals.

REFERENCES

Herbicide labels and MSDS sheets – <http://www.greenbook.net>

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<http://www.nyisri.org/2020/07/knotweed-biocontrol-released-in-nys/>

New York Pesticide Management Education Program: <http://pmep.cce.cornell.edu>

NYSDEC Bureau of Pest Management-Information Portal: New York State Pesticide Administration Database (NYSPAD) Search for a NYS registered pesticide applicators and retailers, chemical label by active ingredient, EPA #, or trade name: <http://www.dec.ny.gov/nyspad/>

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Radosevich, S.R., J.S. Holt, and C.M. Ghersa. 2007. *Ecology of Weeds and Invasive Plants – Relationship to Agriculture and Natural Resource Management*, Third Edition. John Wiley & Sons, Inc.

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USDA NRCS. 2009. *General Manual (Title 190), Part 404, Pest Management Policy*. Washington, DC. <http://directives.sc.egov.usda.gov/RollupViewer.aspx?hid=17015>.

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Winston, R.L., et al. 2017. *Field Guide for the Biological Control of Weeds*. USFS Forest Health Technology Enterprise Team. http://bugwoodcloud.org/resource/pdf/FHTET-2016-04_Biocontrol_Field_Guide.pdf

The public can notify DEC of releases to the environment by calling the NYS Spill Hotline. Federal agencies can be notified by calling the National Response Center.

NYS Spill Hotline: 1-800-457-7362 National Response Center: 1-800-424-8802



Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

CRITICAL AREA PLANTING

CODE 342

(ac)

DEFINITION

Establishing permanent vegetation on sites that have, or are expected to have, high erosion rates, and on sites that have physical, chemical, or biological conditions that prevent the establishment of vegetation with normal seeding/planting methods.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Stabilize areas with existing or expected high rates of soil erosion by wind or water
- Stabilize stream and channel banks, pond and other shorelines, earthen features of structural conservation practices
- Stabilize areas such as sand dunes and riparian areas

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to highly disturbed areas such as—

- Active or abandoned mined lands.
- Urban restoration sites.
- Construction areas.
- Conservation practice construction sites.
- Areas needing stabilization before or after natural disasters such as floods, hurricanes, tornados, and wildfires.
- Eroded banks of natural channels, banks of newly constructed channels, and lake shorelines.
- Other areas degraded by human activities or natural events.

CRITERIA

General Criteria Applicable to All Purposes

Site preparation

Conduct a site investigation to identify any physical, chemical, or biological conditions that could affect the successful establishment of vegetation.

Clear treatment areas of unwanted materials and smooth or shape, if needed, to meet planting purpose(s).

Prepare a suitable seedbed for all seeded species. Rip compacted layers and re-firm the soil prior to seedbed preparation, as needed.

As site conditions dictate, when grading slopes, stockpile topsoil for even redistribution over treatment areas prior to planting.

Species selection

Select species for seeding or planting that are suited to local site conditions and intended uses, and common to the site or location. Match species with site characteristics and purpose of planting as specified in a New York NRCS approved technical reference.

Selected species will have the capacity to achieve adequate density and vigor to stabilize the site within an appropriate time period.

Establishment of vegetation

Plant seeds using the method or methods best suited to site and soil conditions.

Limit sod placement to areas that can naturally supply needed moisture or are suitable for irrigation during the establishment period. Place and anchor sod using techniques to ensure that it remains in place until established.

Specify species, rates of seeding or planting, legume inoculation, minimum quality of planting stock (e.g., pure live seed (PLS) or stem caliper), method of seedbed preparation, and method of establishment before application. Use only viable, high-quality seed or planting stock.

Seed or plant at a time and in a manner that best ensures establishment and growth of the selected species.

Plant during approved times for the species to be used.

Apply soil amendments (e.g., lime, fertilizer, compost) according to current soil test results. Mulch or otherwise stabilize plantings as necessary to ensure successful establishment.

Specify species selection, planting or seeding rates, site preparation, and establishment methods using New York NRCS approved technical references.

Additional Criteria to Stabilize Stream and Channel Banks, Pond and Other Shorelines, Earthen Features of Structural Conservation Practices

Bank and channel slopes

Shape channel side slopes so that they are stable and allow establishment and maintenance of desired vegetation.

A combination of vegetative and structural measures may be necessary on slopes steeper than 3:1 to ensure adequate stability.

Species selection

Plant material used for this purpose must—

- Be adapted to the hydrologic zone into which they will be planted.
- Be adapted and proven in the regions in which they will be used.
- Be compatible with existing vegetation in the area.
- Protect the channel banks but not restrict channel capacity.

Establishment of vegetation

Plant seeds and/or planting stock using the method or methods best suited to site and soil conditions. Specify species, planting rates, spacing, methods and dates of planting based on local planting guides or technical notes.

Identify and protect desirable existing vegetation during practice installation.

Use a combination of vegetative and structural practices with living and inert material when flow velocities, soils, and bank stability preclude stabilization by vegetative establishment alone. Use Conservation Practice Standard (CPS) Streambank Stabilization (Code 580) for the structural measures.

Control existing vegetation on a site that will compete with species to be established vegetatively (e.g., bare-root, containerized, ball-and-burlap, potted) to ensure successful establishment of the planted species.

Plant streambank stabilization vegetation in accordance with the NRCS Engineering Field Handbook Part 650, Chapter 16, "Streambank and Shoreline Protection," and Chapter 18, "Soil Bioengineering for Upland Slope Protection & Erosion Reduction."

Site protection and access control

Restrict access to planted areas until fully established.

Additional Criteria to Stabilize Areas Such As Sand Dunes and Riparian Areas

Plants for sand dunes and coastal sites must be able to survive being buried by blowing sand, sand blasting, salt spray, salt water flooding, drought, heat, and low nutrient supply.

Include sand trapping devices such as sand fences or brush matting in the revegetation/stabilization plans where applicable.

CONSIDERATIONS

Use species or diverse mixes that are adapted to the site and have multiple benefits. Use native species when appropriate for the site.

Use flowering shrubs and wildflowers with resilient root systems and good soil-holding capacity for incorporation as a small percentage of a larger grass-dominated planting to benefit pollinators and other wildlife. Where appropriate consider a diverse mixture of forbs to support pollinator habitat.

Avoid species that may harbor pests and adversely affect nearby crops, plant communities, or species in the planting. Diversify species to avoid loss of function due to species-specific pests.

Planning and installation of other CPSs such as Access Control (472) Diversion (362), Obstruction Removal (500), Subsurface Drain (606), or Underground Outlet (620), may be necessary to prepare the area or ensure vegetative establishment.

Areas of vegetation established with this practice can create habitat for various type of wildlife. Maintenance activities, such as mowing or spraying, can have detrimental effects on certain species. Perform management activities at the times and in a manner that causes the least disruption to wildlife.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for each field or management unit according to the criteria and operation and maintenance sections of this standard. Record practice specifications using approved Implementation Requirements document.

Address the following elements in the plan, as applicable, to meet the intended purpose(s):

- Practice purpose(s)
- Site preparation
- Topsoil requirements
- Fertilizer application
- Seedbed/planting area preparation
- Timing and method of seeding/planting
- Selection of species
- Seed/plant source
- Seed analysis/pure live seed (PLS)
- Seeding rate/plant spacing
- Mulching, PAM, or other stabilizing materials
- Supplemental water needed for establishment
- Protection of plantings
- Describe successful establishment (e.g., minimum percent ground/canopy cover, percent survival, stand density)

OPERATION AND MAINTENANCE

- Control access to the area to ensure the site remains stable.
- Protect plantings shall be protected from pests (e.g., weeds, insects, diseases, livestock, or wildlife) as necessary to ensure long-term survival.
- Inspect, reseed or replant, and fertilize as needed to ensure that this practice functions as intended throughout its expected life.
- Observe establishment progress and success at regular intervals until the practice has met the criteria for successful establishment and implementation.
- Maintain minimum successful establishment thresholds (e.g., minimum percent ground/canopy cover, percent survival, stand density).

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Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

FENCE

CODE 382

(ft)

DEFINITION

A constructed barrier to animals or people.

PURPOSE

This practice is used to accomplish the following purpose:

- Provide a means to control the movement of animals, people, and vehicles to accomplish specific conservation objectives.

CONDITIONS WHERE PRACTICE APPLIES

Apply this practice on any area where management of animal or human movement is needed.

CRITERIA

General Criteria Applicable to All Purposes

Plan, design, and construct this practice to comply with all Federal, State, and local regulations. The landowner must obtain all necessary permissions from regulatory agencies or document that no permits are required. The landowner and/or contractor is responsible for locating all buried utilities in the project area, including drainage tile and other structural measures.

Ensure all fencing materials installed are durable and of high quality, and the type and design of the fence installed meets the management objectives and site challenges. Use permanent, portable, or temporary fences based on management objectives.

Position fences to facilitate changes in management strategies, access requirements, or otherwise meet conservation objectives. The fence design and installation must include height, size, spacing, type of materials, and location of features such as gates and cattle guards.

The fence design and materials must have a life expectancy appropriate for the management system and resource objectives. Base the durability of materials in the design and location of fences on topography, environment, purpose, and management objectives. Specialized bracing, designs, and materials may be necessary to cross features such as gullies, ravines, and streams.

Design, locate, and install fences to minimize impacts on local wildlife as appropriate.

Provide for proper disposal of materials when fence construction requires the removal of existing fencing materials to prevent harm to animals, people, or equipment.

CONSIDERATIONS

Consider soil properties, soil moisture conditions, and erosion concerns.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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Consider livestock management and adaptive grazing strategies, trailing, access to water facilities, and wildlife deterrence or passage.

Consider animal and human safety concerns by enhancing visibility of fences through design materials, fence markers, signage or fladry systems (line of rope mounted along the top of a fence, from which are suspended strips of fabric or colored flags that will flap in a breeze).

Consider using natural barriers where appropriate and design and locate fences to ease access for construction, maintenance, and landscape aesthetics.

Establish cleared rights-of-way to facilitate fence construction and maintenance where applicable. Avoid clearing of vegetation during the nesting and brood rearing seasons for migratory and ground nesting birds.

On certified organic or transitioning operations, consider contacting the organic certification agency to determine the appropriate organically-approved fence post materials to be installed.

PLANS AND SPECIFICATIONS

Prepare plans and specifications that describe the requirements for applying the practice according to the requirements of this standard. As a minimum, include—

- Plan view or map showing layout of fence and location of gates.
- Details for fence installation showing post spacing, bracing, and gate installation.
- Material quantities and requirements.

OPERATION AND MAINTENANCE

Regular inspection of permanent, temporary, and portable fences is a part of an ongoing maintenance program that ensures proper function of the fence for the lifespan of the practice. As a minimum, include the following in the operation and maintenance plan:

- Conduct inspections of fences after storms and other disturbance events
- Repair or replacement of loose or broken material, gates, and other forms of ingress and egress
- Removal of trees and limbs, encroaching brush, or shrouding vegetation
- Repair or replacement of water gaps as necessary
- Repair of eroded areas as necessary
- Repair or replacement of markers or other safety and control features as required
- Maintain fladry or signage as necessary

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Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

RIPARIAN FOREST BUFFER

CODE 391

(ac)

DEFINITION

An area predominantly covered by trees and/or shrubs located adjacent to and up-gradient from a watercourse or water body.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Reduce transport of sediment to surface water, and reduce transport of pathogens, chemicals, pesticides, and nutrients to surface and ground water
- Improve the quantity and quality of terrestrial and aquatic habitat for wildlife, invertebrate species, fish, and other organisms
- Maintain or increase total carbon stored in soils and/or perennial biomass to reduce atmospheric concentrations of greenhouse gasses
- Lower elevated stream water temperatures
- Restore diversity, structure, and composition of riparian plant communities

CONDITIONS WHERE PRACTICE APPLIES

Apply riparian forest buffers on areas adjacent to permanent or intermittent streams, lakes, ponds, and wetlands where channels and streambanks are sufficiently stable.

CRITERIA

General Criteria Applicable to All Purposes

Position and design the riparian forest buffer to achieve enough width, length, vertical structure/density, and connectivity to accomplish the intended purpose(s).

Design for dominant vegetation that consists of existing, naturally regenerated, or seeded/planted trees and shrubs suited to the soil and hydrology of the site and the intended purpose(s).

Extend the vegetation to the minimum width needed to achieve the intended purpose(s). Width of buffer refers to one side of the watercourse. Begin measurement at and perpendicular to the normal water line, bank-full elevation, or the top of the bank as determined locally.

Control excessive sheet, rill, and concentrated flow erosion through the riparian forest buffer site and in the areas immediately adjacent and up-gradient of the buffer site. Utilize NRCS Conservation Practice Standards (CPS) Critical Area Seeding (Code 342) or Conservation Cover (Code 327) as necessary to increase soil erosion control within the Riparian Forest Buffer.

Use tree and shrub species that are native and noninvasive. Substitution with improved locally adapted species, or with species suited for a specific purpose, is allowed. For plantings and seeding, use only viable, high quality, and adapted plant materials. Where available, use the ecological site description to guide restoration to an appropriate vegetative community phase.

Select plant species that are adapted to site and hydrologic conditions and provide the structural and functional diversity preferred by fish and wildlife species likely to benefit from the installation of the practice, provided the intended purpose is not compromised.

Favor tree and shrub species that have multiple values, such as those suited for timber, nuts, fruit, florals, browse, nesting, and aesthetics, provided the intended purpose is not compromised.

Periodic removal of some forest products such as high value trees and medicinal herbs, nuts, and fruits is permitted provided the intended purpose is not compromised by the loss of vegetation or harvesting disturbance. Refer to criteria in NRCS Conservation Practice Standards (CPSs) Forest Stand Improvement (Code 666) and/or Multi-Story Cropping (Code 379).

Perform necessary site preparation and planting at a time and manner that ensures the survival and growth of species selected for achieving the intended purpose(s). Refer to criteria in NRCS CPSs Tree and Shrub Site Preparation (Code 490) and/or Tree and Shrub Establishment (Code 612) as applicable.

Control or exclude livestock as necessary to achieve the intended purpose. Refer to criteria in NRCS CPSs Access Control (Code 472) and/or use Prescribed Grazing (Code 528) as applicable.

Control or exclude harmful plant and animal pests present on the site as necessary to achieve and maintain the intended purpose. If pesticides are to be applied, refer to Windows Pesticide Screening Tool (WIN-PST) Criteria in NRCS CPS Pest Management Conservation System (Code 595) and comply with applicable State and local laws and product labels. Refer to criteria in NRCS CPSs Brush Management (Code 314) and/or Herbaceous Weed Treatment (Code 315) as applicable.

For stabilization of stream banks or shorelines, use NRCS CPSs Streambank and Shoreline Protection (Code 580) and/or Critical Area Planting (Code 342).

Stream type and site hydrology will determine buffer design and layout to ensure purpose is achieved.

Use plant species adapted to the projected duration of site saturation and inundation.

Design tree and shrub stem densities to assure the established riparian forest buffer is predominantly covered by trees and/or shrubs by the end of the practice lifespan.

Additional Criteria to Reduce Transport of Sediment to Surface Water, and Reduce Transport of Pathogens, Chemicals, Pesticides, and Nutrients to Surface and Ground Water

To reduce overland flow transport of sediment and organic material the minimum horizontal width shall be 35 feet.

To treat waterbodies threatened by transport of pathogens, chemicals, pesticides, or nutrients in surface runoff or ground water flows, either extend the minimum horizontal width to 50 feet or add an associated practice that treats the targeted resource concerns. Use NRCS CPSs Filter Strip (Code 393) or Field Border (Code 386).

Filter pollutants from underground drains that bypass the riparian area by plugging, removing, or replacing drains with perforated pipe/end plugs or water control structures. Saturated conditions in the riparian and adjacent areas may limit existing land use and management.

Additional Criteria to Improve the Quantity and Quality of Terrestrial and Aquatic Habitat for Wildlife, Invertebrate Species, Fish, and Other Organisms

The minimum width to improve terrestrial and aquatic habitat shall be 35 feet.

Extend the width to meet the habitat requirements of the wildlife or aquatic species of concern.

Establish plant communities to meet the needs of target aquatic and terrestrial wildlife and provide multiple values such as habitat, nutrient uptake, and shading. Use NRCS CPS Wildlife Habitat Planting (Code 420) to diversify the vegetative community and enhance the wildlife and pollinator values of the riparian forest buffer to establish native herbaceous species.

Additional Criteria to Maintain or Increase Total Carbon Stored in Soils and/or Perennial Biomass to Reduce Atmospheric Concentrations of Greenhouse Gasses

The minimum width to maintain or increase total carbon stored in soils and or plant biomass and to reduce atmospheric concentrations of greenhouse gasses shall be 35 feet.

Maximize width and length of the riparian forest buffer.

Select adapted plants known to sequester high rates of carbon in soils and plant biomass. Use the appropriate stocking, seeding, or planting rate for the site.

Additional Criteria to Lower Elevated Stream Water Temperatures

Establish plant communities capable of reaching adequate heights to provide shade over stream channel water surfaces.

Incorporate topography and bank shade in the riparian forest buffer site design.

CONSIDERATIONS

Maximize widths, lengths, and connectivity of riparian forest buffers.

Avoid tree and shrub species that are alternate hosts to pests. Consider species diversity to avoid loss of function due to species-specific pests.

Use seed and/or seedlings collected or propagated from multiple sources to increase genetic diversity.

Consider selecting species with tolerance to herbicide runoff or spray drift from adjoining fields.

Consider allelopathic impacts of plants.

The location, layout, and density of the buffer should complement natural features and mimic natural riparian forests.

Consider extending the minimum width depending on wildlife species habitat needs. Minimum recommended widths are 50 feet for invertebrates, aquatic species, reptiles, amphibians, and birds that use edge habitat; 100 feet for birds needing interior habitat and small mammals; and 165 feet for large mammals.

For sites where continued function of drains is desired, woody root penetration may eventually plug the underground structure. In these cases, setback woody vegetation from the drain and use herbaceous cover or rigid nonperforated pipe.

When applied near current or historic Native American or other Tribal lands, consider consulting regional Tribes for any traditional ecological knowledge that may be applicable or advantageous to implement.

Materials and methods used to implement the standard on organic and transitioning to organic operations must comply with National Organic Program (NOP) rules and follow the NRCS National Organic Farming Handbook (Title 190), Part 612.

This practice can be included in a NOP applicant's organic system plan as part of the plan for meeting NOP requirements for resource conservation.

Consider how this practice will complement the functions of adjacent riparian, terrestrial, and aquatic habitats.

Consider the effects of upstream and downstream conditions, structures, facilities, and constraints on the planned activities.

Establish alternative water sources or controlled access stream crossings to manage livestock access to the stream and riparian area.

Corridor configuration, establishment procedures, and management should enhance habitats for threatened, endangered, State Species of Greatest Conservation Need, and other plant or animal species of concern, where applicable.

PLANS AND SPECIFICATIONS

Prepare plans and specifications that describe requirements for applying the practice to achieve its intended purpose and obtain any required permits.

Use implementation requirements or other acceptable documentation. At a minimum, provide—

- Objective(s) for establishment.
- Conservation plan map.
- Map showing the location of plantings and/or natural regeneration areas.
- Site preparation and establishment method by species or vegetation type.
- Number and spacing of trees/shrubs per acre by vegetation type.
- Timing of planting relative to seasonal factors, plant physiology, disease, insects, and wildlife impacts.
- Methods of plant protection used during plant establishment.

OPERATION AND MAINTENANCE

Prepare an operation and maintenance plan for the riparian forest buffer site. As a minimum, include—

- Limiting access or damage from vehicles, equipment, livestock, and wildlife, during tree planting and until riparian buffer establishment to protect new plants and minimize erosion, compaction, and other site impacts.
- Schedule inspection of the site at appropriate times following establishment to determine whether the survival rate and condition of trees/shrubs necessary to meet the practice, client, and program objectives are being met.
- Document the site's replacement criteria for dead trees/shrubs and control of vegetative competition determined to be undesirable (may include but not be limited to those on the Federal or State invasive species and noxious weed lists) for the buffer to progress to a fully functional condition.
- Document the site's replacement criteria for dead trees/shrubs and control of vegetative competition determined to be undesirable (may include but not be limited to those on the Federal or State invasive species and noxious weed lists) for the buffer to progress to a fully functional condition.
- Maintain protection of the planting and site from adverse impacts of extreme weather events,

insects,diseases, competing vegetation, fire, livestock, excessive vehicular and pedestrian traffic, wildlife,concentrated flows, non-functioning tree shelters and/or weed barriers, etc.

- Applying fertilizers, pesticides, and other chemicals used to maintain buffer function in a way that will not impact water quality.

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Natural Resources Conservation Service
CONSERVATION PRACTICE STANDARD
TREE-SHRUB SITE PREPARATION

CODE 490

(ac)

DEFINITION

Treatment of sites to enhance the success of natural or artificial regeneration of desired trees and/or shrubs.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Manage soil conditions, naturally available water, and seasonally high water to favor tree and shrub establishment, survival, and growth
- Modify the habitat of weeds, pests, and diseases to reduce pressure on naturally or artificially regenerated trees and shrubs
- Facilitate the establishment, survival, and growth of tree and shrub species

CONDITIONS WHERE PRACTICE APPLIES

On all lands suited to growing woody plants where current site conditions are not suitable for the natural or artificial establishment of desired trees and shrubs.

CRITERIA

General Criteria

- Use mechanical, chemical, or prescribed burning methods either alone or in combination to alter woody residue, vegetation, ground cover, soil, or microsite conditions to prepare the site for planting, seeding, or natural regeneration of desired tree and shrub species. Where herbicides will be used, evaluate and interpret risks using the Windows Pesticide Screening Tool (WIN-PST) or other approved tools or guides, or use NRCS Conservation Practice Standard (CPS) Pest Management Conservation System (Code 595).
- Expose mineral soil as needed to achieve the desired distribution of plants to be established by seed for tree and shrub species that require mineral soil for germination and establishment.
- Determine method(s), intensity, and timing of site preparation activities depending on topography, and on soil and site conditions. Schedule silviculture and site preparation activities so they are completed at the optimal time prior to the commencement of planting or seeding activities, or to the initiation of natural regeneration.
- Leave woody residue in place to provide soil protection and wildlife habitat, retain soil moisture and organic matter, and protect the soil surface from temperature extremes—except where it will pose a fire hazard, increase the risk of pest damage, or interfere with management activities.
- Use NRCS CPS Prescribed Burning (Code 338) when using fire to prepare a site.
- On soils prone to compaction or rut formation, use low ground-pressure equipment or nonmechanized site preparation methods. When preparing compacted cropland or pasture sites

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September 2021

for tree planting, chisel, rip, and/or subsoil to mitigate compacted soil layers, as needed. Use criteria in NRCS CPS Deep Tillage (Code 324).

- Retain desirable surface and canopy cover to protect soil and site conditions. Alternatively use NRCS CPS Cover Crop (Code 340) or Critical Area Planting (Code 342) and/or other measures as needed to control erosion, runoff, and displacement from typical rainfall events.
- Do not use wheeled and tracked equipment on slopes where operability causes safety concerns or adverse impacts on soil conditions. Perform ground-disturbing site preparation activities on the contour where feasible. Restrict the use of wheeled and tracked equipment to periods when the soil is either frozen or unsaturated. Use designated trails or establish a trail system as appropriate and feasible. Use NRCS CPS Forest Trails and Landings (Code 655).
- Mitigate site preparation activities near wetlands, water bodies, and in or near riparian areas to reduce negative water quality impacts.
- Follow State's best management practices for water quality.

Additional Criteria for Reducing Habitat for Harmful Pests and Diseases of Woody Plants

- Remove vegetation infected with transmittable disease (e.g., mistletoe and certain root rots). Consult a professional forester to aid in identifying sanitation measures.
- Treat slash and woody debris so that it does not create habitat for, or harbor, harmful levels of pests. Refer to criteria in NRCS CPS Woody Residue Treatment (Code 384).
- Clean equipment and gear before and after site preparation activities where risk of spread and potential impact from invasive species or harmful pathogens is likely.

Additional Criteria for Ponding, Flooding, and Seasonally High Water

- On sites where a seasonal excess of surface water restricts the establishment or regeneration of desired and adapted trees or shrubs, use temporary water management techniques as allowable by regulation, laws, and policy as needed.
- Where temporary water management is used, limit the depth, spacing, and number of channels to the minimum amount needed to remove excess surface water for tree/shrub establishment or regeneration.
- Temporary water management channels must empty into areas where runoff will be diffused and filtered by vegetation and soils before reaching a natural water body.
- Apply water management activities, including spoil placement, in compliance with the Clean Water Act, Food Security Act, and NRCS Wetland Compliance.

CONSIDERATIONS

To reduce problems associated with insects in logging debris and the reestablishment of undesirable species, consider doing site preparation within one year after logging, followed promptly by planting or natural regeneration.

To reduce negative impacts on wildlife species and their habitat, consider the timing of site preparation to minimize actions that disturb seasonal wildlife activities.

Particulates, smoke, dust, and other air pollutants generated by site preparation may have negative effects on air quality. Consider proximity to populated areas, roads, and visually sensitive areas when planning method and timing of site preparation activities.

Where site preparation requires treatment of competing vegetation, consider alternatives to chemical treatments such as thermal applications, mulching, or solarization. Use other emerging technologies when applicable.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for site preparation in accordance with this standard. Clearly describe the requirements for applying the practice to achieve its intended purpose. As a minimum, include the following in the implementation requirements document:

- Maps, drawings, and narratives, showing areas to be treated, and showing details of the layout of site preparation activities relative to streams, wetlands, or water bodies, underground or overhead utilities, existing access or other infrastructure, etc., as applicable.
- Description of existing land use and vegetative cover.
- Description of site preparation methods to be used and application dates.
- Description of mitigations for compaction, erosion, soil organic matter removal, and any other anticipated site impacts.
- State whether site preparation is for natural or artificial regeneration. If artificial, provide the planned date for tree planting, timed appropriately relative to site preparation.
- Details on undesirable plant species to be treated and control methods to be used.
- Description of contingency plans in case of flooding or other disturbances that impact implementation schedules or mitigations.
- References to other conservation practice specifications, if applicable.

OPERATION AND MAINTENANCE

Operation

Site preparation operations will comply with all local, State, and Federal laws and ordinances, and with State's forestry best management practices for water quality.

For site preparation using herbicides, the operator will develop a safety plan for individuals exposed to chemicals, including telephone numbers and addresses of emergency treatment centers and the telephone number for the nearest poison control center. The National Pesticide Information Center (NPIC) telephone number in Corvallis, Oregon, may also be given for nonemergency information: 1-800-858-7384, Monday to Friday, 6:30 a.m. to 4:30 p.m. Pacific Time. The national Chemical Transportation Emergency Center (CHEMTRAC) telephone number is 1-800-424-9300.

- Follow label requirements for mixing/loading setbacks from wells, intermittent streams, and rivers, natural or impounded ponds and lakes, and reservoirs.
- Post signs, according to label directions and/or Federal, State, Tribal, and local laws, around fields that have been treated. Follow restricted entry intervals.
- Dispose of herbicides and herbicide containers in accordance with label directions and adhere to Federal, State, Tribal, and local regulations.
- Read and follow label directions and maintain appropriate material safety data sheets.
- Calibrate application equipment according to recommendations before each seasonal use and with each major chemical and site change.
- Replace worn nozzle tips, cracked hoses, and faulty gauges on spray equipment.
- Herbicide application records shall be kept in accordance with USDA Agricultural Marketing Service's Pesticide Recordkeeping Program and State-specific requirements.

Determine the success of the practice by evaluating post-treatment conditions and verifying that they are suitable for the establishment of desired trees and shrubs.

To protect against the spread of invasive species from the use of equipment, follow the control and bio-security measures outlined in General Engineering Specifications for Pollution Control, found in Section IV of NY's FOTG. [https://efotg.sc.egov.usda.gov/api/CPSFile/30285/000_NY_GS-001_Pollution_\(Con\)trol_2021](https://efotg.sc.egov.usda.gov/api/CPSFile/30285/000_NY_GS-001_Pollution_(Con)trol_2021)

Maintenance

Following initial application, some regrowth, sprouting, or reoccurrence of undesirable plants may occur within a year of treatment. Prior to tree and shrub establishment, spot treatment of individual undesired plants or areas needing re-treatment should be completed as needed while vegetation is small and can be most successfully treated, during the lifespan of this practice. Delayed planting dates (planned or unexpected) may require O&M of CPS-490 to be extended or the practice re-applied to maintain or recover the original purpose, otherwise treat undesirable vegetation with NRCS CPS Brush Management (Code 314) or NRCS CPS Herbaceous Weed Treatment (Code 315) after tree and shrub establishment. Maintain erosion control measures, and access control of vehicles, wildlife, or livestock, to support successful establishment of this practice and to avoid lasting site impacts as necessary.

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Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

PRESCRIBED GRAZING

CODE 528

(ac)

DEFINITION

Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic, and management objectives.

PURPOSE

Apply this practice as a part of a conservation management system to achieve one or more of the following—

- Improve or maintain desired species composition, structure and/or vigor of plant communities
- Improve or maintain quantity and/or quality of forage for grazing and browsing animals' health and productivity
- Improve or maintain surface and/or subsurface water quality and/or quantity
- Improve or maintain riparian and/or watershed function
- Reduce soil erosion, and maintain or improve soil health
- Improve or maintain the quantity, quality, or connectivity of food and/or cover available for wildlife
- Manage fine fuel loads to achieve desired conditions

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where grazing and/or browsing animals are managed.

CRITERIA

General Criteria Applicable to All Purposes

Manage stocking rates and grazing periods to adjust the intensity, frequency, timing, duration, and distribution of grazing and/or browsing to meet the planned objectives for the plant communities, and the associated resources, including the grazing and/or browsing animals.

Remove forage in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants, and the nutritional needs of the animals.

Provide desired grazed/browsed plants sufficient recovery time from grazing/browsing to meet planned objectives. The recovery period can be provided for part or all of the growing season of key plants. Deferral and/or rest will be planned for critical periods of plant or animal needs.

Manage livestock movements based on rate of plant growth, available forage, and identified objectives such as utilization, plant height or standing biomass, residual dry matter, and/or animal performance.

Manage grazing and/or browsing animals to maintain adequate vegetative cover on sensitive areas (i.e., riparian, wetland, habitats of concern, and karst areas).

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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NRCS, NY
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Provide adequate quantity and quality of drinking water during period of occupancy.

Develop contingency plans to deal with expected episodic disturbance events (e.g., drought, wildfire, insect infestation, etc.).

Develop monitoring plans that directly support adaptive management decisions based upon identified ecologic triggers and thresholds to optimize the conservation outcome for the selected purposes.

Conform to all applicable Federal, State, Tribal and local laws. Seek measures to avoid adverse effects to endangered, threatened, and candidate species and their habitats.

Additional Criteria to Improve or Maintain the Health and Vigor of Desired Plant Communities

Base the intensity, frequency, timing, and duration of grazing and/or browsing on desired plant health, expected productivity, and composition of key species to meet management objectives.

Plan periodic deferment from grazing and/or browsing to maintain or restore the desired plant community following grazing/browsing and episodic events, such as wildfire or severe drought.

Where appropriate, test soil periodically for nutrient status and soil reaction, and apply fertilizer and/or soil amendments according to soil test results to improve or maintain plant vigor

Additional Criteria to Improve or Maintain Quantity and Quality of Forage for Animal Health and/or Productivity

Plan grazing and/or browsing to match forage quantity and/or quality goals of the producer within the capability of the resource to respond to management.

Enhance diversity of rangeland and pasture plants to optimize delivery of nutrients to the animals by planning intensity, frequency, timing, and duration of grazing and/or browsing.

Plan intensity, frequency, timing, and duration of grazing and/or browsing to reduce animal stress and mortality from toxic and/or poisonous plants.

Provide supplemental feed and/or minerals as needed to balance with forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.

Base the dietary needs of livestock on the National Research Council's Nutrient Requirements of Domestic Animals or similar scientific sources with appropriate adjustments made for increased energy demand required by browsing or grazing animals foraging for food including travel to and from grazing/browsing area.

Additional Criteria to Improve or Maintain Surface and/or Subsurface Water Quality and/or Quantity

Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover.

Manage intensity, frequency, timing, and duration of grazing, browsing and/or feeding to—

- Minimize deposition or flow of animal wastes into water bodies.
- Minimize animal impacts on stream bank or shoreline stability.
- Maintain or improve hydrologic function including infiltration and/or filtering capacity and soil surface stability to reduce runoff by providing adequate ground cover, plant spacing, and plant density.

Additional Criteria to Improve or Maintain Riparian and/or Watershed Function

Minimize concentrated livestock areas to improve or maintain riparian/floodplain plant community structure and functions.

Plan intensity, frequency, timing and duration of grazing and/or browsing to—

- Provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff.
- Provide optimum ground cover, plant density, and/or plant structure to maintain or improve filtering capacity of the vegetation.
- Maintain adequate riparian community structure and function to sustain associated riparian, wetland, floodplain, and stream species.

Additional Criteria to Reduce Soil Erosion and Maintain or Improve Soil Health

Minimize concentrated livestock areas, trailing, and trampling to reduce soil compaction, excess runoff and erosion, and maintain soil organic matter.

Plan intensity, frequency, timing, and duration of grazing and/or browsing to provide adequate ground cover, litter, and canopy to maintain or improve infiltration.

Additional Criteria to Improve or Maintain Food and/or Cover for Fish and/or Wildlife Species of Concern

Identify species of concern in the objectives of the prescribed grazing plan.

Plan intensity, frequency, timing, and duration of grazing and/or browsing to provide for the development and maintenance of the plant structure, density, and diversity needed for the habitat requirements of the desired fish and wildlife species of concern.

Additional Criteria for Management of Fine Fuel Load

Plan intensity, frequency, timing, and duration of grazing and/or browsing to manage fuel continuity and loading to reduce wildfire hazard and/or facilitate desired conditions for prescribed burns.

CONSIDERATIONS

Protect soil, water, air, plant, and animal resources when locating livestock feeding, supplementation, handling, and watering facilities.

Design and install livestock feeding, handling, and watering facilities in a manner to improve and/or maintain animal distribution. Design and install facilities to minimize stress, the spread of disease, parasites, contact with harmful organisms, and toxic plants.

Utilization, stubble height, and other target levels are tools that can be used in conjunction with monitoring to help ensure that resource conservation and producer objectives are met.

Where practical and beneficial, start the grazing sequence in a different management unit each growing season.

When weeds are a significant problem prescribed grazing and/or browsing should be implemented in conjunction with other pest management practices to promote plant community resistance to invasive species and protect desired plant communities.

Prescribed grazing should consider the needs of other enterprises utilizing the same land, such as wildlife and recreational uses.

Develop alternatives that minimize additional grazing management infrastructure while still achieving plan objectives for the desired fish and wildlife species of concern.

Provide deferment or rest from grazing or browsing as necessary to ensure the success of prescribed fire, brush management, seeding, or other conservation practices to prevent stress or damage to key plants

Use drought forecasting tools and soil water forecasts where available to promote the accuracy of forage production projections.

Improve carbon sequestration in biomass and soils through management of grazing and/or browsing to produce the desired results.

Plan biosecurity safeguards to prevent the spread of disease between on-farm or ranch classes of livestock and between livestock farm or ranch units.

Provide shelter in the form of windbreaks, sheds, shade structures, and other protective features where conditions warrant to protect livestock from severe weather, intense heat/humidity, and predators.

If nutrients are being applied, CPS Nutrient Management (Code 590) will be applied.

Maintain conservative stocking rates as a drought contingency strategy to minimize detrimental consequences during drought on economic and ecological sustainability.

PLANS AND SPECIFICATIONS

Prepare a prescribed grazing plan for all planned conservation management units where grazing and/or browsing will occur according to State standards and specifications.

Prescribed grazing plan will include—

- Goals and objectives clearly stated.
- Resource inventory that identifies—
 - Existing resource conditions and concerns.
 - Ecological site or forage suitability group.
 - Opportunities to enhance resource conditions.
 - Location and condition of structural improvements such as fences, water developments, etc., including seasonal availability and quality of watering sites.
- Forage inventory of the expected forage quality, quantity, and species in each management unit(s).
- Forage-animal balance developed for the grazing plan that ensures forage produced or available meets forage demand of livestock and/or wildlife.
- Grazing plan developed for livestock that identifies periods of grazing and/or browsing, deferment, rest, and/or other treatment activities for each management unit that accommodates the flexibility needed for adaptive management decisions as supported by the contingency plan and monitoring plan in order to meet goals and objectives.
- Contingency plan developed that details potential problems (i.e., drought, flooding, and insects) and serves as a guide for adaptive management decisions in grazing prescription adjustments in order to mitigate resource and economic effects.
- Monitoring plan developed with appropriate protocols and records that assess whether the grazing strategy is resulting in a movement toward meeting goals and objectives. Short-term and long-term monitoring may be needed to determine outcomes and support timely adaptive management decisions. Identify the key areas, key plants, or other monitoring indicators that the manager should evaluate in making grazing management decisions.

OPERATION AND MAINTENANCE

Operation

Prescribed grazing will be applied on a continuing basis throughout the livestock occupation period of all planned grazing units.

Adaptive management decisions will be made as needed and documented within the plan to ensure that the goals and objectives of the prescribed grazing strategy are met.

Maintenance

Monitoring data and grazing records will be used on a regular basis within the prescribed grazing plan to ensure that objectives are being met, or to make necessary changes in the prescribed grazing plan to meet objectives.

All facilitating and accelerating conservation practices (e.g., CPS Fence (Code 382), Pest Management (Code 595), Brush Management (Code 314), Forage and Biomass Planting (Code 512), etc.) that are needed to effect adequate grazing and/or browsing distribution as planned by this practice standard will be maintained in good working order and operated as intended.

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Natural Resources Conservation Service
CONSERVATION PRACTICE STANDARD
TREE-SHRUB ESTABLISHMENT

CODE 612

(ac)

DEFINITION

Establishing woody plants by planting seedlings or cuttings, by direct seeding, and/or through natural regeneration.

PURPOSE

Establish woody plants to:

- Maintain or improve desirable plant diversity, productivity, and health by establishing woody plants.
- Create or improve habitat for desired wildlife species compatible with ecological characteristics of the site.
- Control erosion.
- Improve water quality. Reduce excess nutrients and other pollutants in runoff and groundwater.
- Sequester and store carbon.
- Restore or maintain native plant communities.
- Develop renewable energy systems.
- Conserve energy.
- Provide for beneficial organisms and pollinators.

CONDITIONS WHERE PRACTICE APPLIES

Tree/shrub establishment can be applied on any site capable of growing woody plants.

CRITERIA

General Criteria Applicable to All Purposes

Select one or more species that are suited to soil and site conditions, and appropriate for the planned purpose(s).

Determine desired stocking levels for trees and/or shrubs based on ecological characteristics of the site and species, and landowner objectives. Plant, seed, and/or naturally regenerate at densities/rates that reflect anticipated seedling mortality, to achieve desired stocking levels in the established stand.

Use NRCS Conservation Practice Standard (CPS) Tree/Shrub Site Preparation (Code 490) to prepare sites for planting, seeding, or natural regeneration, if conditions are not suitable for establishing the desired plants.

When utilizing natural regeneration to establish trees and/or shrubs, ensure that a source of seed and/or vegetative propagules is or will be present, or that advanced reproduction exists, sufficient to achieve objectives. Where natural regeneration relies on seed sources, apply any needed stand treatments and/or

site preparation at appropriate times to facilitate germination and establishment of seeds from desired species. Modify forest stand conditions as needed, using CPS Forest Stand Improvement (Code 666), to create favorable stand structure for initiating natural regeneration. Use NRCS CPSs Prescribed Burning (Code 338), Brush Management (Code 314), and/or Herbaceous Weed Control (Code 315), as needed, to obtain the desired species composition, density, and arrangement of trees/shrubs in naturally regenerated areas. Implement coppice regeneration (originating from root shoots or stump sprouts) based on suitability of tree species, age, diameter, and site conditions. Determine the correct timing for coppice regeneration based on species characteristics.

Use tree/shrub planting to accomplish or supplement forest stand regeneration in locations where natural regeneration of desired species is not possible, or will not meet objectives.

Select only viable, high-quality, and adapted plant materials. Select planting stock that conforms to established seed transfer protocols within the State, and complies with minimum standards accepted by the American National Standards Institute (ANSI). Do not plant any species on the Federal or State invasive species or noxious weed lists.

Choose appropriate planting dates and handling methods to increase rates of survival. Select planting techniques and timing appropriate for soil and site conditions.

Alter species selection and/or timing of planting/seeding to minimize potential effects of residual chemical carryover, as needed.

Evaluate the site to determine if mulching, supplemental water or other cultural treatments (e.g., tree protection devices, shade cards, brush mats, etc.) are needed to assure adequate survival and establishment. Minimize the need for supplemental water and/or nutrients by choosing site-adapted plant materials, planting methods, and planting seasons. Where supplemental moisture is needed to achieve tree/shrub establishment use NRCS CPS Irrigation System, Microirrigation (Code 441).

Protect tree and shrub plantings, seeded areas, and naturally regenerated areas, from unacceptable adverse impacts of pests, wildlife, livestock, and/or fire. Protect from pests, as necessary, by applying integrated pest management techniques for pest prevention, avoidance, monitoring, and suppression.

Removal of products (e.g., trees, biomass, medicinal herbs, nuts, fruits, etc.) is allowed, provided that conservation purpose(s) are not compromised by the loss of vegetation or by harvesting disturbance.

Additional Criteria for Reducing Nutrients and Pullutants

When plantings are used to remove excess nutrients from runoff or groundwater, select species that have fast-growth characteristics, extensive root systems, and a high-nutrient uptake capacity. Trees and shrubs used to reduce pollutants must be tolerant of the types of pollutants contained in effluent or soils at the site.

Additional Criteria for Restoring or Maintaining Native Plant Communities

Species selected for planting, or those favored in natural regeneration, will be native to the site and will create a successional state that progresses toward the identified target plant community.

Additional Criteria for Sequestering and Storing Carbon

For shorter term, rapid carbon sequestration, select species that have high-growth rates, recognizing that they are typically short-lived. For longer term storage of carbon, select plants with a long life span, the ability to reach a large size, high-wood density, and potential for use in long-lived products. Establish and maintain a fully stocked stand.

Additional Criteria for Developing Renewable Energy Systems

Select plants that can provide adequate types and amounts of plant biomass to supply identified bioenergy needs.

Manage the intensity and frequency of energy biomass removals to prevent long-term negative impacts to the site.

Harvest biomass for energy in a manner that will not compromise other intended purpose(s) and functions of the site.

Additional Criteria to Conserve Energy

Increase energy efficiency by planting trees to provide shade for buildings.

Select plants with a potential height growth that will be taller than the structure or facility being protected. Use proper plant densities to optimize the shade produced.

Design tree and shrub plantings to avoid damage to structures, and to allow adequate space for maintenance access to walls and windows. Plant at a distance that is greater than mature crown spread, and select species that develop deep root systems.

To protect structures from heat loss due to wind, use NRCS CPS Windbreak Establishment (Code 380).

Additional Criteria for Habitat for Beneficial Organisms

Plant trees and shrubs that provide habitat and food sources for beneficial organisms, such as pollinators, predatory and parasitic insects, spiders, insectivorous birds and bats, raptors, and terrestrial rodent predators. Select plant species that meet dietary, nesting, and cover requirements for the intended beneficial organisms during the critical period for control of target pests and, if possible, for the entire year.

Protect beneficial organisms from harmful pesticides.

CONSIDERATIONS

Consider utilizing plant materials that have been selected and tested in the Plant Materials Program or in similar tree/shrub improvement programs.

Consider using diverse tree and shrub species combinations which best meet the needs of desired wildlife and pollinator species.

When selecting plant materials, consider whether the species, variety, or cultivar possesses aggressive traits, and whether it poses a potential threat to the existing or desired plant community.

Consider the potential impacts of extreme weather events (e.g., drought, flooding, wind, late spring frosts) when selecting plant species and sites for planting.

When using trees and shrubs for carbon sequestration and storage, consider using modeling tools to predict carbon sequestration rates and amounts of stored carbon.

Tree/shrub arrangement and spacing should allow for and anticipate the need for future access lanes for purposes of stand management and fire control.

When underplanting, trees and shrubs should be planted sufficiently in advance of overstory removal to ensure full establishment where feasible.

Consider establishing species with growth rates and at densities that make them competitive with weeds and undesirable plants.

Consider using species that provide subsistence and cultural values, (e.g., as used by Tribes).

Consider designing plantings to enhance visual quality in farmsteads, recreation areas, and along public rights-of-way, by applying foliage color, season and color of flowering, mature plant height, edge-feathering, and other landscaping techniques.

Considerations for Organic Systems During Vegetation Establishment

Natural mulches, such as wood products or hay, can be used to support tree/shrub establishment by controlling competing vegetation, as a viable alternative to using herbicides. Certified weed-free mulches are preferred. NRCS Use CPS Mulching (Code 484).

Pests may be managed through augmentation or introduction of predators or parasites and development of habitat for natural enemies of pests; non-synthetic controls such as lures, traps, and repellents may be used.

Invasive plant species may be controlled through mulching with fully biodegradable materials; mowing; livestock grazing with protection for plantings; hand weeding and mechanical cultivation; pre-irrigation; flame, heat, or electrical means. Use NRCS CPS Prescribed Burning (Code 338), as needed.

Considerations for Reducing Energy Use

When trees are planted to reduce summer energy use in buildings, consider prioritizing their placement on the west side of the building, where the greatest daily solar heat gain occurs. The second priority is the east side. Trees or shrubs planted within 30 to 50 feet of a building generally provide effective shade to windows and walls, depending on tree height potential.

Deciduous tree or shrub species planted adjacent to the south side of buildings in cool climates can provide shade in the summer yet allow sun to reach the building in winter.

PLANS AND SPECIFICATIONS

Prepare plans and specifications that describe requirements for applying the practice to achieve its intended purpose, and obtain any required permits.

Use job sheets or other acceptable documentation. At a minimum, provide—

- Objective(s) for establishment.
- Sketches, drawings, and detail drawings.
- Map showing the location of plantings and/or natural regeneration areas.
- Soils map, and description of soils and Ecological Sites (if available).
- Establishment method by species or vegetation type.
- Number of trees/shrubs per acre to be planted, by species.
- Timing of planting and/or natural regeneration relative to considerations for seasonal factors, plant physiology, disease, insects, and wildlife impacts.
- Mitigation measures, if needed, to reduce wildfire hazard or the potential for disease and insect pests.

OPERATION AND MAINTENANCE

Prepare an operation and maintenance plan for this site. As a minimum, include the following activities:

- Burn or mow the area periodically, if needed to maintain the health of the plant community. Do not conduct maintenance practices and activities during the primary reproductive period of wildlife. Exceptions can be considered to maintain the health of the vegetative community if such exceptions do not conflict with agency requirements.
- Control access by vehicles and/or equipment during or after tree/shrub establishment to protect new plants and minimize erosion, compaction and other site impacts.
- Inspect the site at an appropriate time following planting, seeding, and/or natural regeneration to determine whether the survival rate for tree and shrubs meets practice and client objectives. Replant or provide supplemental planting when survival is not adequate.
- Inspect the trees and shrubs periodically, and protect them from adverse impacts of insects,

diseases, competing vegetation, fire, livestock, wildlife, non-functioning tree shelters and/or weed barriers, etc.

- If needed, control competing vegetation until the desired trees/shrubs are established. Control plant species on the Federal or State invasive species and noxious weed lists.
- If needed, apply nutrients to maintain vigor of desirable trees/shrubs.

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Natural Resources Conservation Service
CONSERVATION PRACTICE STANDARD
EARLY SUCCESSIONAL HABITAT DEVELOPMENT-MGT

CODE 647

(ac)

DEFINITION

Manage plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.

PURPOSE

This practice is used to accomplish one or more of the following purposes–

- To provide habitat for species requiring early successional habitat for all or part of their life cycle

CONDITIONS WHERE PRACTICE APPLIES

On all lands that are suitable for the kinds of desired wildlife and plant species.

CRITERIA

General Criteria Applicable to All Purposes

Management will be designed to achieve the desired plant community structure (e.g., density, vertical and horizontal cover) and plant species diversity. Use habitat evaluation or assessments found in Section 1- Resource Assessment Tools of the NY FOTG, or approved by the NRCS State Office, to identify habitat limiting factors in the planning area that need to be addressed for the target species.

Measures must be provided to control noxious weeds and invasive species.

If using chemical methods of control, Pesticide Screening Tool (WinPST) shall be used to assess risks, and appropriate mitigation to reduce known risks shall be employed.

To benefit insect food sources for grassland nesting birds, spraying or other control of noxious weeds will be in a targeted manner through the use of spot spraying, mechanical or hand wick applicators, or other approved methods to protect grasses, forbs and legumes that benefit native pollinators and other wildlife.

Management will be timed to minimize negative impacts to wildlife. Disturbance to habitat will be restricted during critical periods (e.g., wildlife nesting, brood rearing, fawning or calving seasons).

Minimize soil disturbance in natural communities where soil integrity is essential, on steep slopes, on highly erodible soil, and where establishment of invasive species is likely.

When grazing is used as a management tool, a prescribed grazing plan developed to specifically meet the intent and objective(s) of this practice standard is required.

CONSIDERATIONS

General Considerations

Vegetative manipulation to maximize plant and animal diversity can be accomplished by disturbance practices that include, but are not limited to: selected herbicide techniques, brush management prescribed burning, light disking, mowing, prescribed grazing, or a combination of these.

This practice should be applied periodically to maintain the desired early successional plant community and rotated throughout the managed area.

Wildlife habitat purposes often require lighter seeding rates than specified to prevent soil erosion.

Design and install the treatment layout to facilitate:

- operation of machinery
- use of natural firebreaks or development and maintenance of bare soil firebreaks when prescribed burning.

When prescribed grazing, consider setting aside a paddock near the center of the pasture and defer grazing until after the critical nest and brood rearing period. Many grassland birds require more than 40 days to fledge their young.

When selecting plants and designing management for this practice, consider the needs of pollinators and incorporate to the maximum extent practicable.

PLANS AND SPECIFICATIONS

Written specifications, application schedules and maps shall be prepared for each site. Specifications shall identify the amounts and kinds of habitat elements, locations and management actions necessary to achieve management objectives.

Specifications shall be transmitted to clients using approved NY Implementation Requirements (IR) or by other written documentation approved by NRCS.

OPERATION AND MAINTENANCE

The actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance).

Occasional disturbance may be incorporated into the management plan to ensure the intended purpose of this practice.

Any use of fertilizers, pesticides and other chemicals shall not compromise the intended purpose.

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