Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

FOREST STAND IMPROVEMENT

CODE 666

(ac)

DEFINITION

To manipulate species composition and stocking by cutting or killing selected trees and understory vegetation.

PURPOSE

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

- Increase the quantity and quality of forest products by manipulating stand density and structure.
- To facilitate forest stand regeneration.
- To improve understory aesthetics, wildlife habitat, or recreation.

CONDITIONS WHERE PRACTICE APPLIES

On forest land where competing vegetation hinders development and stocking of preferred species.

CRITERIA

General Criteria Applicable to All Purposes

All management decisions shall be based on a woodland inventory.

Forest Stand Improvement cuttings should be done as soon as the need becomes apparent. Cut or deaden: *1/*

- cull and “wolf” trees (may be retained for wildlife,)
- undesirable species,
- damaged trees,
- diseased trees,
- surplus sprouts.

1/ Note: Indiana bat has been found in Iowa. Follow the most recent guidelines from the US Fish and Wildlife Service to protect the Indiana Bat, a federally listed endangered species.

Comply with applicable laws and regulations.

Soil erosion, displacement, hydrologic impact, and damage to remaining vegetation will not exceed acceptable levels. Minimize disturbances such as rutting, soil compaction, excessive disturbance of the litter layer, and the addition of fill material.

Limit damage to the site by:

- using directional felling;
- aligning cut boles for efficient skidding;
- cutting out forks and large branches;
- limiting trails to less than 15 percent of the site;
- logging when the soil is dry or frozen;
- using smallest size equipment possible; and
- using well-organized access trails.

The method, felling direction, and timing of tree cutting shall facilitate efficient and safe tree removal.

Slash, debris, and vegetative material left on the site after treatment will not interfere with the intended purpose and will present minimal pest and fire hazards.

Mechanical cutting or girdling may need to be followed by a suitable herbicide application to increase mortality and reduce stump sprouting.

Kill unwanted trees, shrubs, and vines by any of the following means:

- cut stump treatment,
- girdling,
- frilling,
- stem injection, and
- basal bark spray.

When choosing herbicides, review leaching, runoff potential, setback requirements, persistence, and toxicity ratings of chemical formulations. Use the safest available herbicide.

Pesticides used improperly can be injurious to people, animals, and plants.

Follow all label directions and label precautions.

Section II-(iii)-C, Forest Land Interpretations of the Field Office Technical Guide should be used in determining desirable tree species estimating potential site productivity or the Iowa Forestry Practices Manual Technical Guide and the Iowa Woodland Suitability Recommendations at: http://www.iowadnr.gov/Environment/Forestry/ForestryLandownerAssistance/ChoosingNativeIowaTrees/Publications.aspx

Protect the area from grazing, except prescribed grazing practices included in an approved Forest Stewardship Plan.

Protect riparian zones and other unique areas. Leave a strip of existing woody vegetation, a minimum 50 feet wide, along streams to protect water quality. Some light forest stand improvement work can be done in this strip.

Where riparian protection is needed, follow Riparian Forest Buffer (391).

Additional Criteria to Improve or SustainTimber and Forest Products Production

All stands: Thin at 10-15 year intervals, up until three-fourths of the rotation age is reached.

Keep improvement cuttings light enough (maintain at least 60 percent stocking) to restrict the growth of any undesirable species, to maintain full site utilization, to reduce sunscald damage, and to reduce epicormic *(a shoot sprouting from a dormant bud on the stem of a tree)* branching and basal sprouting.

Base thinning choices on:

- relative tree position,
- crown position,
- crown condition,
- tree health,
- bole quality, and
- species.

All thinning methods should follow proper silviculture standards. Basal Area thinning should follow appropriate stocking guide. Crop Tree Release thinning should follow guidelines in USDA publication NA-TP-19-93.

Strip or row thinning is possible in plantations. Remove enough rows to achieve the desired stocking.

Prescribed fire may be used to reduce fuel buildup.

Refer to Prescribed Burning (338) for additional guidance. A prescribed burn plan shall be prepared.

Additional Criteria to Facilitate Forest Stand Regeneration

Silvicultural practices to improve conditions more favorable for natural regeneration in the desired forest type.

- Practice will be completed in the last one quarter of rotation age.

Methods may include:

- weeding and culling,
- herbicide treatment,
- treatment prescribed burning to expose mineral soil for improved germination.

Refer to Prescribed Burning (338) for additional guidance. A prescribed burn plan shall be prepared.

Additional Criteria to Improve Wildlife Habitat

Rotate forest stand improvements through a stand so that various stages of plant succession will be established.

If wildlife enhancement is an objective, do the following:

Perform thinning to encourage fuller crown development, earlier seed production, and heavier herbaceous plant development.

Favor hard-mast producers (oak, hickory, pecan, and walnut) and conifers.

Leave or establish two to five snags and two to five den trees per acre, ranging in size from 6 to 20 inches DBH.

Create two or three brush piles per acre with material from forest stand improvement work.

Low intensity prescribed fires may be used to improve/increase green browse for wildlife.

Refer to Prescribed Burning (338) for additional guidance. A prescribed burn plan shall be prepared.

For additional management guidelines refer to Upland W ildlife Habitat Management (645).

Additional Criteria to Improve Aesthetics and Recreation

This activity is strongly influenced by subjective values and interests. Direct forest stand improvements toward:

- opening vistas,
- installing trails,
- increasing vegetation diversity (shape, texture, color, and size),
- removing safety hazards near pedestrian use areas (snags, large dead limbs, etc.),
- creating visual screens.

CONSIDERATIONS

These specifications are intended to help identify and determine basic forest stand improvement activities. Consult a professional forester for assistance.

Forested wildlife corridors can minimize habitat fragmentation.

Forest stand improvement activity for timber production is most effective on better sites (site index > 55), but can improve yield and quality on nearly all site conditions.

If chemicals are used to control vegetation, the potential for surface and/or ground water contamination exists. Follow all label directions and seek guidance from experienced pesticide advisors such as university extension or certified crop specialists.

PLANS AND SPECIFICATIONS

Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Operation and maintenance requirements are not applicable for this practice.

REFERENCES

Crop Tree Management In Eastern Hardwoods, USDA, Forest Service, Northeastern Area State & Private Forestry, Forest Resources Management, Morgantown, WV, NA-TP-19-93.

Forestry Handbook, Second Edition, Society of American Foresters, 1984.

Increased Woodland Products through Timber Stand Improvement, Agricultural Guide 5150, University of Missouri Extension Division, 1984.

Managers Handbook for Oaks in the North Central States, General Technical Report NC-37, North Central Forest Experiment Station, Forest Service, USDA, 1977.

Managers Handbook for Black Walnut, General Technical Report NC-38, North Central Forest Experiment Station, Forest Service, USDA, 1977.

Managing Shortleaf Pine in Missouri, Station Bulletin 875, Agricultural Experiment Station, University of Missouri, 1969.

Managing Forests to Maintain Populations of Gray and Fox Squirrels, Technical Bulletin 5, Illinois Department of Conservation, 1987.

The Practice of Silviculture, David M. Smith, John Wiley & Sons, Eighth Edition, 1986.

Snag and Den Tree Management, Timber and Wildlife Benefits on Private Land - No.5, Missouri Conservation Commission, 1985.

Working with Your Woodland - A Landowner's Guide, Beattis, Thompson, and Levin, University Press of New England, 1983.

Central Hardwood Notes, Jay Hutchinson, Editor, USDA Forest Service, North Central Forest Experiment Station, 1989.