NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

FOREST STAND IMPROVEMENT

(Acre)

CODE 666

DEFINITION

Removing unmerchantable and unwanted trees, shrubs, or vines from wooded areas.

PURPOSE

To fully use the potential of a site; to maintain plant cover for soil protection; to improve stand composition by leaving the best trees, spaced for best growth; or to improve the natural beauty, wildlife, or recreation values of the area.

CONDITIONS WHERE PRACTICE APPLIES

In a woodland where a stand of trees is overstocked or where desirable trees are overtopped by less desirable trees, shrubs, or vines; where removing part of a stand will improve stand quality, or the recreation, wildlife, aesthetic, or hydrologic values of an area.

SPECIFICATIONS GUIDE*

Species to Favor

Favor existing species according to the kind of soil. (Consult Column 12 in the Woodland Suitability Grout Table, Section II-F or Soil Survey Interpretation Sheets, Section II-L of this Technical Guide.)

Where to Apply

On any woodland tract having a site index of 70 or above. (Consult Column 4 in the Woodland Suitability Group Table, Section II-F, or Soil Survey Interpretation Sheet, Section II-L of this Technical Guide.) Leave shrubs, vines, and low-value trees in a 40-foot wide strip unimproved along all open woodland edges for wind protection and wildlife cover. Leave one to two hollow den trees per acres.

A. When to Apply

1. Very young stands (ages 5-15 years).

    a. Weeding (guide future species composition).

        (1) Select desired seedings and sapling (future crop tree) at optimum spacing (see spacing guide, Part C.).

        (2) Remove as many competing woody weed specimens from between the desired future crop trees as will ensure free, unhampered growth of the crop trees until time for the next thinning (about 5-10 years, depending upon intensity of weeding).

* The specification guide is prepared to assist in helping a land user understand the need for woodland improvement. The actual marking and layout for woodland improvement should be done by an ODNR service forester, other professional forester, or person with adequate training.

b. Crop-tree release (removing any tree competing with trees planned as the final crop during a rotation.

(1) The tree species to favor should be based on the soil site. Over the entire state, this is too complex and varied to be covered in the scope of these specifications. Consult Sec. II-L "Soil Survey Interpretation Sheet" and Sec. II-F-1 "Ohio Soil Interpretation for Woodland Use" for the predominant soils to determine species to favor.

(2) Release desired stems from overtopping by older culls, wolf trees, weed tree species, and grapevines.

(3) Deaden or fell larger, undesired trees that overtop desired crop tree seedlings and saplings.

(4) Cull material can be utilized for fuel wood.

c. Sanitation (removing trees infested with insects and/or disease).

(1) Detect early, and attempt to control epidemics of tree insects, and diseases.

(2) Inspect woods at least twice annually (summer and winter) for signs of unusual insect/disease activity.

(3) Seek expert advice for establishing identity and installing applicable control measures.

2. Young developing stands (15-50 years).

a. Thinning (reduce number of crop trees per acres).

(1) See "Spacing Guide" Part C.

(2) Deaden or fell undesirable specimens.

b. Crop tree release.

(1) See Para. A.1.b.

c. Sanitation.

(1) See Para. A.1.c.

3. Older stands (50 + years).

a. No thinning needed (no response expected).

b. Sanitation.

(1) See A.1.c. (may need harvest cut, refer to Woodland Improved Harvesting (654), Technical Guide Section IV).

4. Uneven-aged stands: Stands that are uneven-aged, and especially those that have had no management in the past, should be treated according to need. These stands frequently contain large "cull," or wolf, trees that should be eliminated as soon as possible. ("The sooner-the-better" is usually the best rule to follow on such timber stands.)

a. Select individual future crop trees at optimum spacing.

b. Release only crop trees from woody competition and vines.

c. Inspect woods periodically for unusual “build-ups” of insects or diseases.

B. How to Eliminate Undesirables

1. Saplings to 3” diameter breast high (dbh).

   a. Cut down with machete or axe.

2. Small poles 3”-6” dbh.

   a. Basal wetting (lower 18” of trunk and root collar with approved silvicide, or;

   b. frill girdle; apply silvicide to frills.

3. Trees larger than 6” dbh.

   a. Frill girdle; apply silvicide to frills, or just girdle.

   b. Inject silvicide at root collar, using commercial tree injector.

C. Spacing of Trees Left

Spacing of crop trees remaining after the improvement work is a technical determination, generally made by a forester. Spacing shall be determined by the thinning guide on the Midwest Woodland Information Stick or by the following: Hardwood Stocking Guides for “Reference Handbook for Foresters,” USDA Forest Service, NA-FR-15, January 1980, Technical Guide Reference File, Woodland Conservation, Woodland Planning h).

SPACING GUIDE
(NRCS-Midwest Woodland Information Stick)

	Oak-Hickory-Yellow Poplar Stands:			Beech-Maple Stands		
Ave Dia.	Spacing	No. Trees Per Acre	Basal Area Per Acre	Spacing	No. Trees Per Acre	Basal Area Per Acre
6	13	258	52	12	304	59
8	16	170	59	15	194	69
10	19	121	66	18	135	73
12	22	90	71	21	99	78
14	25	70	76	23	83	88
16	27	60	84	25	70	97

SPACING GUIDE
("Reference for Foresters" USDA-Forest Service NA-FR-15, January 1980)

	Oak-Hickory-Yellow Poplar Stands:			Beech-Maple Stands		
Ave Dia.	Spacing	No. Trees Per Acre	Basal Area Per Acre	Spacing	No. Trees Per Acre	Basal Area Per Acre
6	13	290	56	12	290	58
8	16	175	62	15	180	65
10	19	120	68	18	135	75
12	22	88	72	21	105	82
14	25	63	74	23	85	90
16	27	54	76	25	54	95

D. Aesthetic, Wildlife, Recreation and Hydrologic Considerations

Where these values are important, they should be given attention in the planning of the improvement cut. This will usually involve the following:

1. Leaving exceptionally attractive trees, regardless of value as crop trees.

2. Leaving den trees, nut trees, and other trees valuable to wildlife where multiple use is desired.

3. Providing access and elimination of safety hazards in areas of recreation use.

4. Avoiding undue disturbance to preserve hydrologic value.

REFERENCES:

"Timber Stand Improvement in Ohio Woodlands" Bulletin 697, The Ohio State University, Cooperative Extension Service, McClenahen, Cowen, and Heiligmann, 9/82.