

Landowner:		Farm #:
Field/Stands(s):	Acres:	Tract #:
Soil Map Unit(s):		County:
Designed By:		Contact Information:
Date:		

**DEFINITION:**

Forest Stand Improvement (FSI) is a forest management technique used to remove unwanted trees from an area in order to improve forest stand composition. In Missouri, young trees readily re-establish themselves following cutting or fire. But tree quality, species composition and individual tree form are often undesirable. Further reduction in quality comes when the better trees are harvested, leaving the lower quality ones. The average unmanaged Missouri woodland produces at less than one-third its potential. The application of FSI thins the forest by killing undesirable or unmerchantable trees. This improves the growing condition for the remaining trees by reducing competition for sunlight, water, and nutrients. The FSI practice can be used to increase the woodland's value for timber products, water quality and quantity, recreation, wildlife habitat, natural beauty, and/or special products.

**PURPOSE: (check all that apply)**

- Increase quantity and quality of forest products
- Restore natural plant communities
- Enhance aesthetic, recreation and open space values
- Improve water quality
- Increase sequestration of carbon
- Improve water conservation yield
- Improve wildlife habitat
- Reduce damage from wildfire, pests and disease
- Initiate forest stand regeneration of desirable species

**SPECIFICATIONS:**

Minimize disturbances to the site such as rutting, soil compaction, excessive disturbance to the litter layer, and the addition of fill material.



*Provide crown growing space on two or more sides of residual trees when thinning hardwood stands.*

Facilitate efficient and safe tree removal by controlling the method, felling direction, and timing of tree cutting. Slash, debris and vegetative material left on the site should not present a fire or pest hazard or interfere with the intended purpose. Protect sensitive areas such as vernal pools, riparian zones, and cultural resources.

Kill unwanted trees, shrubs, and vines by any of the following means: **(check all that apply)**

- |   |  |
|---|--|
| <input type="checkbox"/> cutting          | <input type="checkbox"/> frilling                    |
| <input type="checkbox"/> girdling         | <input type="checkbox"/> stem injection              |
| <input type="checkbox"/> basal bark spray | <input type="checkbox"/> foliar spray on small trees |

**Even and Un-even Aged Thinning**

Base forest stand improvement choices on:

- Relative tree position
- Crown position
- Crown condition
- Tree health
- Stem quality
- Species

For **even-aged** stands with an average stand diameter less than 6 inches Diameter Breast Height (DBH), thin stands to 10-foot spacing. Table 1 illustrates spacing and stocking levels for stands with average diameters of 6 to 12 inches DBH.

For **uneven-aged** stands create or maintain age/size classes which occupy an equal amount of ground space per acre. (i.e. 25% seedling/sapling, 25% pole, 25% small sawtimber, 25% large sawtimber) Each improvement activity should:

- regenerate a new age/size class (if needed)
- harvest mature trees and excess numbers in each age/size class
- maintain or develop appropriate age/diameter class distributions

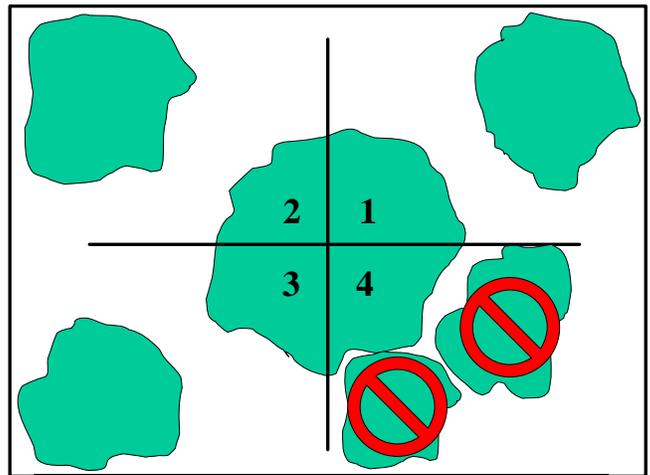
Table 1. Thinning guide for even-aged residual stocking

Average Stand Diameter (inches)	Spacing (feet)	Basal Area (sq. ft.)	Trees/Acre (no.)
<b>Hardwood</b>			
6	13	55	258
8	16	60	170
10	19	65	121
12	23	70	82
<b>Pine</b>			
6	12	60	304
8	14	75	222
10	16	90	170
12	18	105	134

**Crop Tree Release Thinning**

Select 20 to 75 crop trees per acre based on the following criteria:

- Dominant or codominant canopy tree
- Healthy crown
- Minimal epicormic branching
- Good form
- Free of defects and disease
- Desired species
- Adapted species



Remove all trees in direct competition with the crop trees.

Remove all trees in direct, adjacent competition with the crop trees. For optimum response, provide at least 10 to 15 feet of crown growing space on all quadrants of residual crop trees.

**Additional Specifications (Check all that apply):**

- treat **all** stumps with an approved herbicide
- treat **only** the stumps of undesirable species with an approved herbicide
- remove unwanted or undesirable trees down to \_\_\_\_ inch DBH
- maintain maximum stump height of \_\_\_\_ inches for desirable species and \_\_\_\_ inches for undesirable species



If chemical application is needed, use the following products at label rates:

Stand	Herbicide	Treatment

**When choosing herbicides, review leaching, runoff potential, setback requirements, persistence, and toxicity ratings of chemical formulations. Use the safest available herbicide. Herbicides used improperly can be injurious to man, animals, and plants. *Follow all labels.***

**MAINTENANCE:**

- Rotate thinning through each stand to establish various stages of plant succession and age classes
- Monitor treated acres for invasive species and take appropriate action to control/suppress such species
- Monitor treated acres for possible insect and/or disease outbreaks



*Always use proper safety equipment when doing forest stand improvement.*

**SITE SPECIFIC COMMENTS AND RECOMMENDATIONS**

conserve, maintain, and improve our natural resources and environment.

An Equal Opportunity Provider and Employer