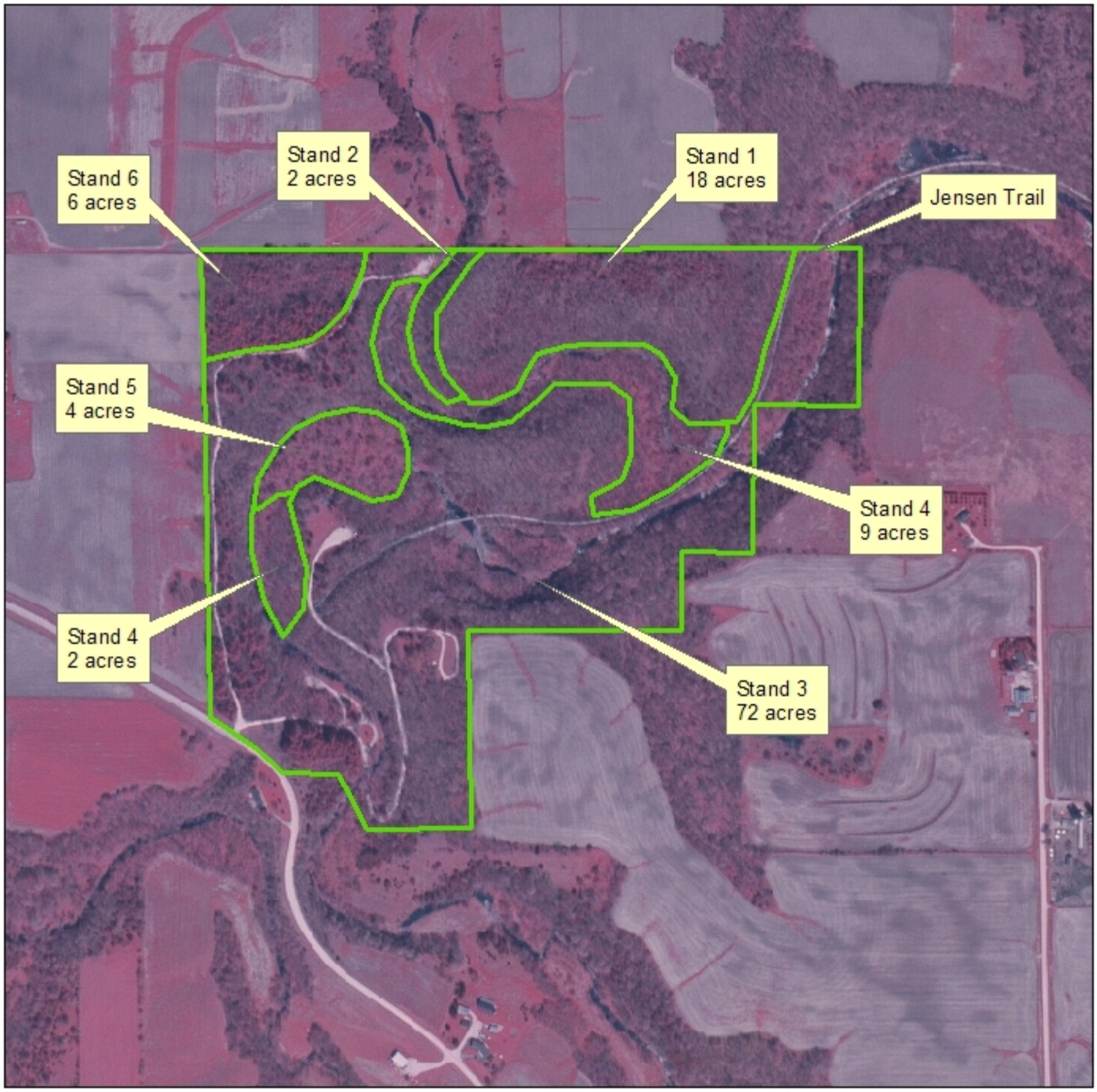
FOREST STEWARDSHIP PLAN

FOR

ECHO VALLEY

Developed by Gary Beyer
District Forester
and
Rod Marlatt
Fayette County
Conservation Board

FOREST STEWARDSHIP PLAN
FOR ECHO VALLEY
FAYETTE COUNTY CONSERVATION

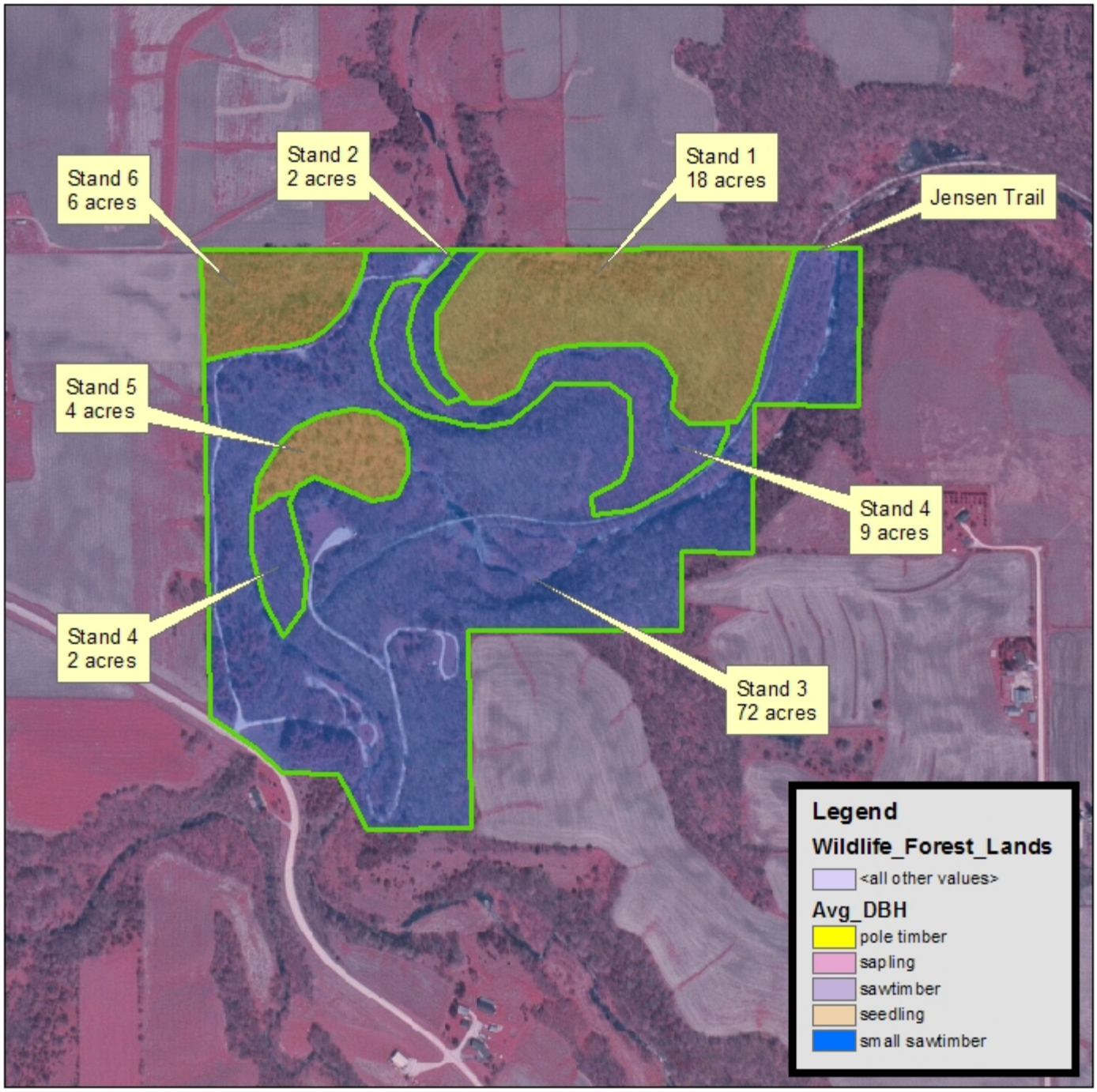


Sec. 22 Union Twsp.,
T94N-R8W, Fayette Co.

0 265 530 1,060 1,590 2,120
Feet

N

ECHO VALLEY
AVERAGE TREE SIZE

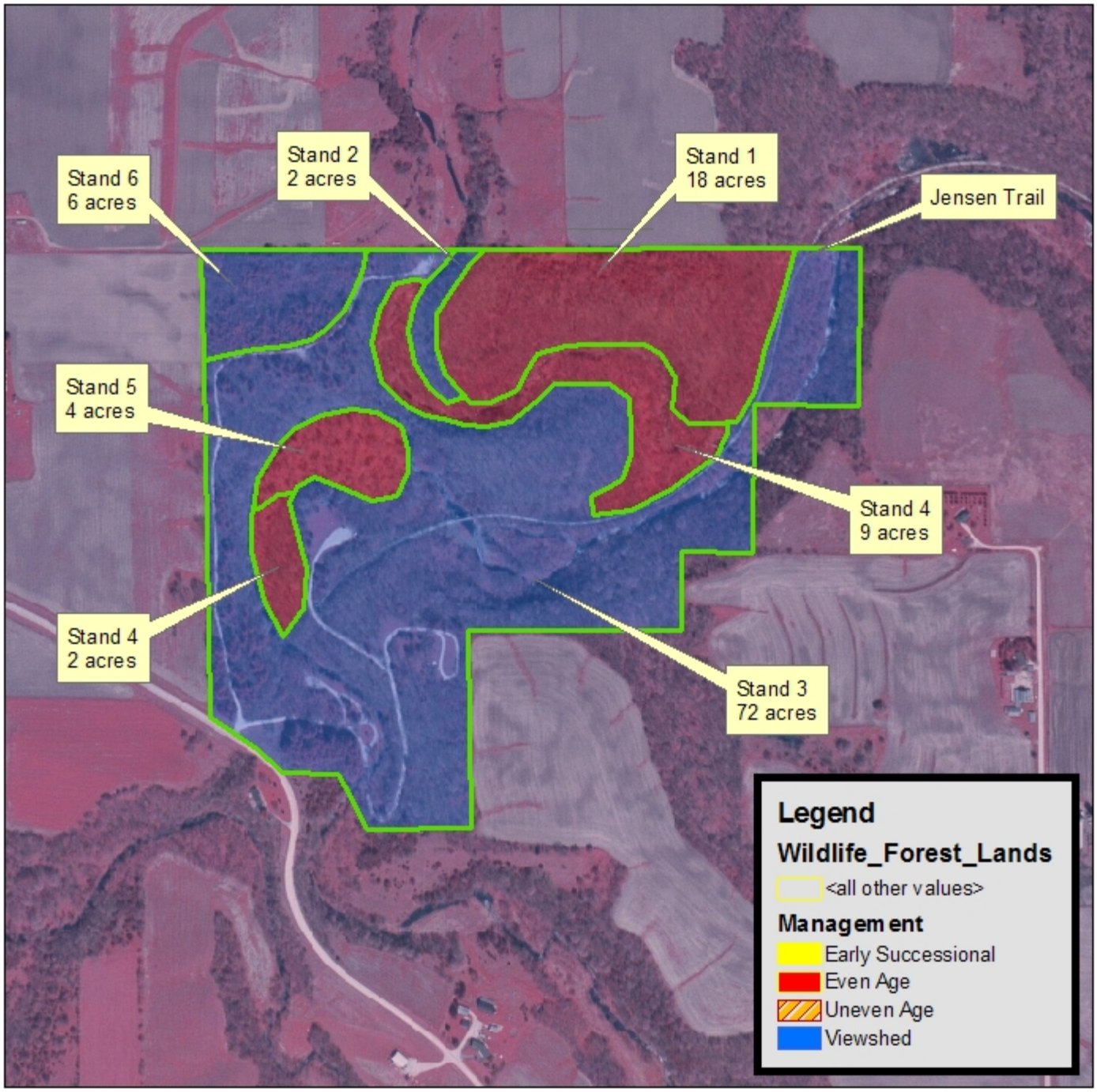


Sec. 22 Union Twsp.,
T94N-R8W, Fayette Co.

0 265 530 1,060 1,590 2,120
Feet

N

ECHO VALLEY
MANAGEMENT SYSTEMS



Sec. 22 Union Twsp.,
T94N-R8W, Fayette Co.

0 265 530 1,060 1,590 2,120
Feet

N

DATE: 3/23/07

FOREST STEWARDSHIP PLAN
FOR
ECHO VALLEY

Prepared by Gary Beyer, District Forester
And Rod Marlatt, Fayette County Conservation Board

MANAGER:

Rod Marlatt, Director
Fayette County Conservation Board
18673 Lane Rd.
Fayette, Iowa 52142

TELEPHONE: 563/422-5146

LOCATION: Sec. 22 Union Twsp., T94N-R8W, Fayette County

TOTAL ACRES: 113

DESCRIPTION OF AREA

The 113 acres addressed in this plan are outlined on the attached aerial photo. The area is divided into 6 different areas or stands, labeled 1-6 on the map. Each area is described in this plan and recommendations outlined for woodland management.

Glover's Creek and Otter Creek run through the area. Both streams are stocked trout streams. Echo Valley is a very scenic area with limestone bluffs and wooded slopes. This area is used extensively for fishing, hiking, and picnicking.

The woodland consists of red oak, white oak, bur oak, hard maple, basswood, ash, cherry, and scattered white pine. There are stands of walnut in the bottomland. The understory is shade tolerant hardwoods such as elm, ironwood, hard maple, bitternut hickory, and basswood. Honeysuckle is present over much of the area.

Objectives -

The primary objectives for the area are recreation and wildlife. This is a very beautiful area enjoyed by the public. It is important to protect the trout stream, maintain large trees including the white pine, and promoting oak where feasible. This Forest Stewardship Plan strives to develop a forest ecosystem that has a diversity of tree sizes and species. Developing a diverse forest will benefit the widest variety of wildlife species.

Oak acorns are an important food source for many species of wildlife. Maintaining large oak trees and regenerating young stands of oak to replace the older trees are a major focus of the recommendations. Oak is by far the most important tree for a variety of wildlife species, and is a difficult tree to regenerate because it will not survive in shade. Thinning young stands where oak is present is the most effective way to maintain oak on the area. Removing trees competing with the young oaks will insure healthy, vigorous oak trees that will continue to grow into large trees.

Echo Valley has many sites that are unique from a plant and geological stand point. The limestone bluffs are very scenic and many people enjoy the trout stream and wooded slopes. Because of this, 80 acres, or 71% of the area is designated at viewshed. Limited forest management is recommended for the viewshed areas.

Current Distribution of Tree Size on the Area -

The woodland was stand mapped according to the average tree size as follows:

Tree Size	**Acres**	**% of Total Area**
Sapling (<4" dbh)	0	0
Pole size (5-12" dbh.)	28	25
Medium (14-18" dbh.)	85	75
Large (>20" dbh)	0	0
Totals	113	100

Proposed Management Systems for the Area -

Recommendations for each stand were based on whether the area will be managed to create early successional growth, or on an even age system, uneven age system, or as viewshed. The decision on what system will be used was based on the objectives for the areas to maintain an oak component where feasible, develop a diverse woodland landscape, protect fragile sites, and improve water quality.
Based on my recommendations for Echo Valley, the acres under each management system are as follows -

Management System	**Acres**	**% of Total Area**
Early Successional		
Even Age	33	29
Uneven Age		
Viewshed	80	71
Total	113	100

Early Successional Management -

Many species of birds such as ruffed grouse, American woodcock, gold winged warbler, blue winged warbler, black billed cuckoo, yellow billed cuckoo, and eastern towhee are dependent on the early stages of woody growth. The high stem density of both trees and shrubs provides suitable nesting habitat and protection from predators. Because aspen will spout from the roots when the parent tree is cut, aspen is an excellent species to create the dense growth needed by these species. Aspen also is a short lived tree species, and cutting the aspen will rejuvenate and expand the aspen stands through root sprouting.

The majority of early successional management is on the woodland edges and aspen stands. This work will "feather" the edges and make a gradual transition from the field edges to the larger trees. Feathering or softening the edges results in less nest parasitism of interior forest bird species by brown-headed cowbirds.

Aspen provides critical habitat for ruffed grouse. Aspen is most easily regenerated by root suckering. Once aspen is allowed to become over mature, its ability to root sucker is decreased. The best method to maintain aspen and expand the aspen clone is to cut the stand while the trees are in a healthy condition. Ideally, 1/3 of the aspen would be sapling size (1-4" dia.), 1/3 pole sized (5-10" dia.), and 1/3 medium sized (12-16" dia.). Big tooth aspen will grow to 16-20" in diameter, but small tooth aspen generally begins to die at 14-16" in diameter.

There is no early successional management planned for Echo Valley.

Even Age Management -

Even age management is essential for wildlife species depending on oak/hickory forests. Even though large blocks of forest are needed for some wildlife species, each stage of an even age stand provides habitat for wildlife. For example, regenerating stands (1-10 years) benefit the same species of birds as does early successional stands; golden-winged warbler, blue-winged warbler, black-billed cuckoo, yellow-billed cuckoo, Eastern towhee, along with ruffed grouse and American woodcock.

Sapling to small pole sized stands between 10 and 20 years, may be used by black and white, Kentucky, and worm eating warblers. From age 20 to 60 years, pole to medium size trees tend to be used by canopy nesters such as scarlet tanagers, wood thrushes, and ground nesters such as ovenbirds and black and white warblers.

Mature stands of 60 to 125 years of age are used by birds such as the wood thrush, Acadian flycatcher, ovenbird, worm-eating warbler, and scarlet tanagers.

Even age management involves growing a stand of trees which are close to the same age. At some point in the stands life, the area is clearcut which creates the even age structure. Even age management creates excellent habitat for deer, turkey, and grouse and is essential for regeneration of oak which require full sunlight. The only way that oak can be maintained as a component of the forest is by practicing some form of even age management.

Even age management involves clearcuttting and planting, clearcutting with regeneration already established, or a shelterwood system to develop desirable seedlings on the ground.

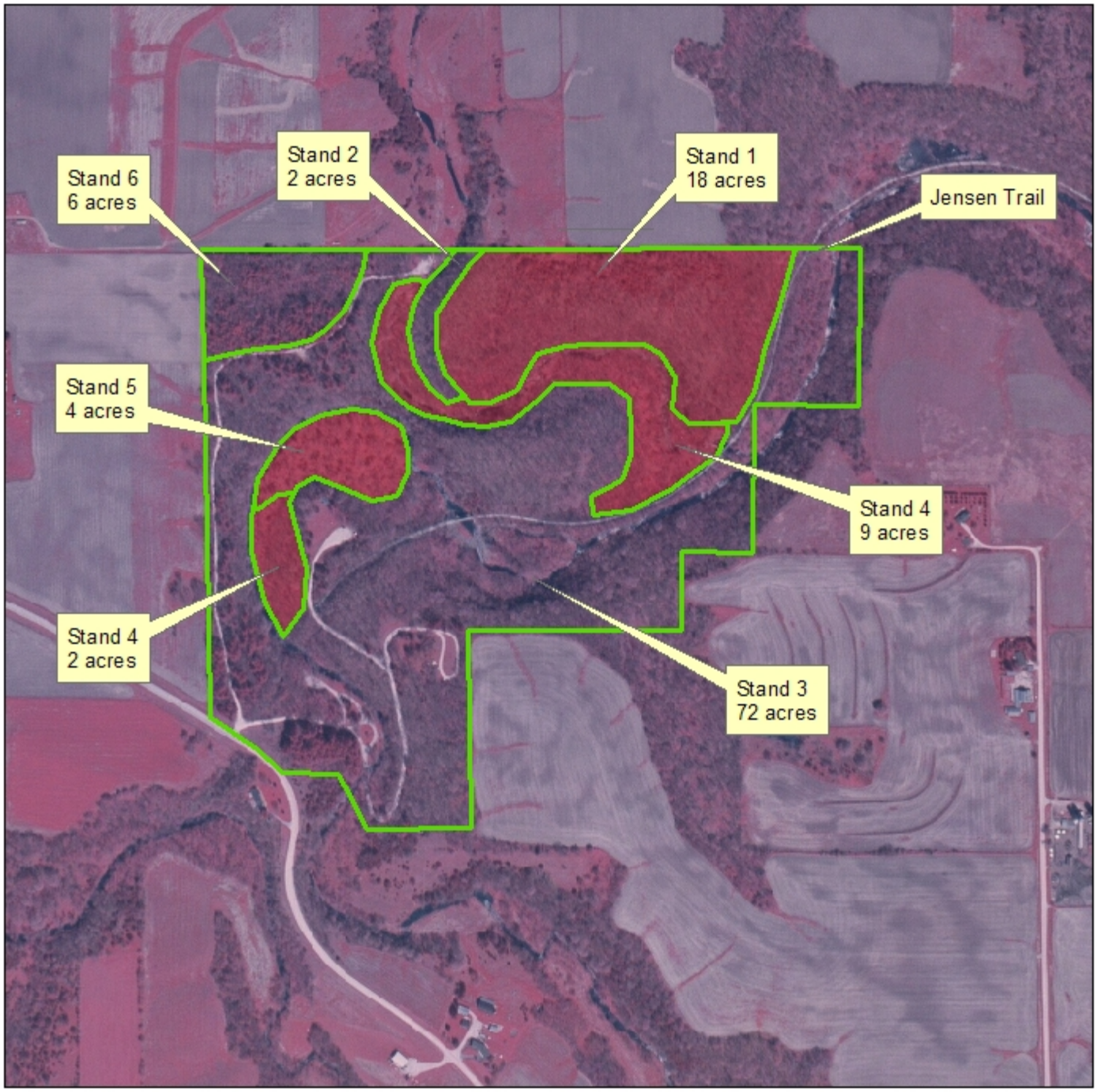
Shelterwood is a form of even-age management. The final cut is a clearcut, but several thinnings are done prior to the final cut. The large, healthy trees are left to provide seed for naturally reseeding the stand, and to create partial shade to inhibit the growth of weeds and brush until the desirable seedlings are well established. The final cut or clearcut is normally done when there are a sufficient number of desirable trees that are 3-5 ft. tall. The shelterwood system can take many years to develop a good stocking of desirable young trees. You may have to kill the undesirable species several times to favor the species you want. The final clearcut should not be made until you are satisfied with the stocking of desirable young trees.

Clearcutting to create full sunlight is essential at some point in the stands life to successfully regenerate oak. If stands are not clearcut, the oak

component of the forest will be lost to shade tolerant species. Clearcuts also provide additional early successional habitat in the early stages. The area is in the brushy stage for a very short period, normally 10-15 years. After that time, the trees will totally shade the ground, and the area becomes a pole sized (5-10" dia.) stand of trees.

Stands 1, 4, and 5, totaling 33 acres are planned as even age management areas.

FOREST STEWARDSHIP PLAN
FOR ECHO VALLEY
EVEN AGE MANAGEMENT - 33 ACRES



Sec. 22 Union Twsp.,
T94N-R8W, Fayette Co.

0 265 530 1,060 1,590 2,120
Feet

N

Uneven Age Management -

Uneven age management develops a stand of trees with all tree sizes represented. The stand structure is developed by selectively harvesting mature and defective trees, and removing unwanted small trees that are damaged or defective. Because uneven age stands always have large trees present, this system favors species that will grow in shade such as hard maple and basswood.

Uneven age management will maintain blocks of woodland that will always have larger trees. Uneven age management is desirable where the understory is mainly hard maple, on steep slopes, and on areas where always having large trees is important.

Uneven age management areas will provide continuous tracts of woodland with minimal disturbance. Large tracts of uneven management will provide necessary habitat for neotropical migratory birds such as cerulean, hooded, Canada, and Kentucky warblers. Selective harvesting will create small openings in the canapy, which will increase ground cover, and enhance stand structure. Den trees will be left to provide cavities for wildlife such as woodpeckers, bats, and squirrels, including the Northern myotis and red squirrel, species of greatest conservation need. Timber stand improvement and selective harvesting will create woody debris on the forest floor for reptiles and amphibians.

There are no uneven age management areas planned for Echo Valley.

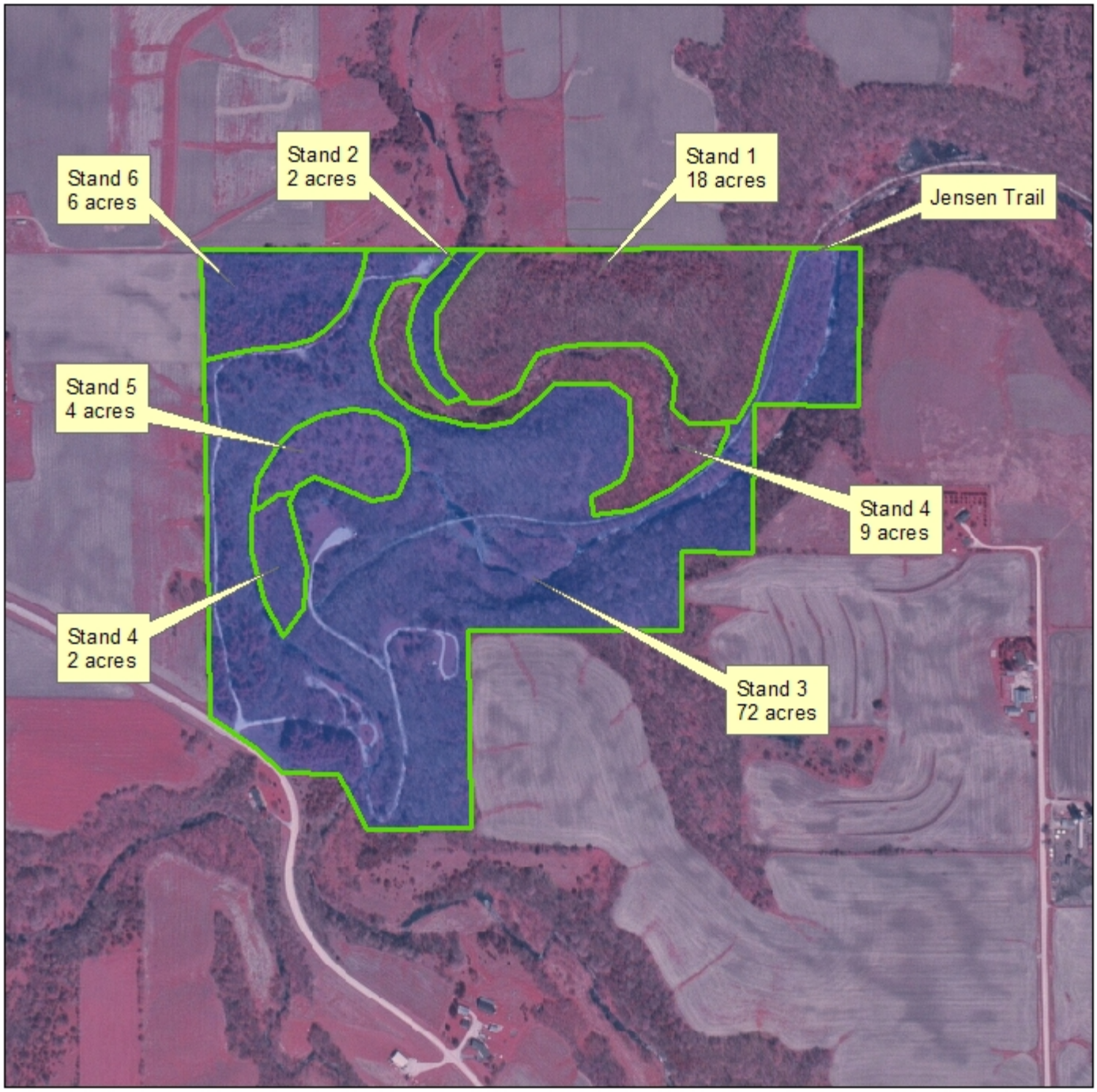
Viewshed Management -

Viewshed areas are typically steep slopes and areas along streams which are fragile and are best left to naturally progress through succession. Areas where endangered plant or animal species exist will also be under viewshed management. Management can take place on these areas where desirable, but the major objective is to have very minor disturbance if any.

Many neotropical migratory birds will benefit greatly from the areas designated as viewshed. Algific slopes and maderate slopes will be under viewshed management which will protect 8 species of land snails listed as species of greatest conservation need.

Viewshed management is designated for 80 acres on the area, or 71% of the forest resource.

FOREST STEWARDSHIP PLAN
FOR ECHO VALLEY
VIEWSHED MANAGEMENT - 80 ACRES



Sec. 22 Union Twsp.,
T94N-R8W, Fayette Co.

0 265 530 1,060 1,590 2,120
Feet

N

Soils

The steep slopes have shallow soils over limestone. There are rock outcrops and limestone bluffs. Bur oak and red cedar normally occupy these dry slopes. The ridge tops have Fayette and Dubuque silt loam soils. These are very good soils for upland hardwood trees such as oak, hickory, and walnut. The bottomland has alluvial soils, which are soils deposited by flooding. Normally bur oak, swamp white oak, silver maple, cottonwood, and hackberry grow best on the floodplain sites.

The bottomland areas in Echo Valley are dominated by walnut. Walnut is sensitive to poorly drained soils, but these areas are draining within a day or two and the walnut are growing fine.

WORK PLAN

FOR

ECHO VALLEY

This is the "working plan" for Echo Valley designed to aid managers in the implementation of forest management practices. It is written with the understanding that these professionals have an understanding of forest management principles and techniques. All of the details of the management techniques suggested are not listed because the plan would become too long to be of practical use. This plan is intended to get work accomplished on the ground.

FOREST MANAGEMENT

DESCRIPTION AND RECOMMENDATIONS FOR INDIVIDUAL STANDS

Stand 1: 18 acres

Even Age Management -

Stand 1 is a ridge top and south facing slope. The timber is pole sized (6-10" dbh) walnut, red oak, elm, hard maple, bitternut hickory, cherry, ash, and white oak. There are scattered, large white oak. The understory is elm and honeysuckle.

Stand 1 can be managed on an even age system. The scattered, large trees can be left to provide acorns for wildlife. Working around the large trees, the stand can be thinned to provide more growing space for the most desirable trees.

Timber Stand Improvement (Crop Tree Release) –

In pole-sized stands (4-10" dia.), potential crop trees can be selected and released. At maturity, there is room for 35-50 trees per acre. Now you can select the trees you want to comprise your future stand of mature trees and thin around them to give them more growing space. Select a crop tree every 30-35 ft. apart. Remove trees with crowns that are touching or overtopping the crowns of your crop trees. Crop trees can be selected based on criteria that meets your objectives. Normally, the crop trees will be a desirable species, show good form without large side limbs, and be free of major defects. Species normally favored are black walnut, red oak, white oak, white ash, basswood, cherry, and hard maple.

Locate your good quality trees. Do not waste your time and money on poor quality trees. If there are no high quality trees present on an area, go on to an area with good trees. You can not create high quality trees. Either they are present or not. Be selective and work with only your best trees.

The trees to be removed can be felled or double girdled. No herbicide is necessary.

Stand 2: 2 acres

Viewshed Management -

Stand 2 is a steep, west facing slope with limestone outcrops. The timber is small sawtimber bur oak, elm, red oak, and basswood. There are scattered red cedar. This area should be managed as viewshed and left as is.

Stand 3: 72 acres

Viewshed Management -

Stand 3 is the largest stand and consists of steep slopes along the trout streams. The woodland is diverse with medium sized aspen, hard maple, red oak, basswood, walnut, white oak, and scattered white pine. There are large trees that are remnants of the original stand of trees interspersed throughout the area.

Stand 3 contains the unique land forms and plants on the area. This area should be managed as viewshed and enjoyed as is. There are scattered areas with pole sized red oak. The future species diversity of this area could be enhanced by locating the young oak and removing the competing trees. This would help to maintain an oak component on the site. Providing more crown space for the oaks would also increase mast production.

Timber Stand Improvement (Oak Release) -

Locate the scattered red, white, and bur oak that are 4-12 inches in diameter. Double girdle or fell trees with crowns that are touching or overtopping the crowns of the oak. Double girdling the trees that are competing with the oak will kill the trees creating good habitat for woodpeckers and species that utilize cavities. In areas where dead trees will pose a hazard to the public, the trees should be felled.

Stand 4: 11 acres

Even Age Management (Shelterwood) -

There are two areas labeled as “Stand 4”. Both areas are bottomland with mainly medium sized (14-18” diameter) walnut. There are scattered, mature walnut. Other species include ash and elm. The understory is elm, boxelder, ash, hackberry, and honeysuckle. Some of the area is being overtaken with honeysuckle. These areas can be managed on a shelterwood system to regenerate desirable species such as walnut, hackberry, and bur oak. A shelterwood system maintains the healthy large trees to provide seed for natural regeneration. The undesirable species are removed in the understory to allow sunlight to reach the ground. As desirable, young trees are established, additional large trees are harvested to provide the necessary sunlight for the young trees.

Walnut Harvest -

There are 37 walnut trees that could be harvested in the near future. The trees are low quality, damaged, or mature. Following is a summary of the walnut that are ready for harvest.

Diameter	# of Trees	Est. Bd. Ft.
14	3	110
16	5	310
18	1	70
20	10	1,240
22	7	1,190
24	8	1,690
26	3	760
Totals	37	5,370

Timber Stand Improvement -

Following the walnut harvest, the undesirable species in the understory could be killed to allow more sunlight to reach the ground. This would include the removal of the honeysuckle in the area. Cut honeysuckle, elm, bitternut hickory, and boxelder. Treat the outer rim of fresh cut stumps with Pathfinder II to prevent sprouting.

Stand 5: 4 acres

Even Age Management -

Stand 5 is an old lake bed. The area has naturally seeded with boxelder, elm, and a few walnut. The understory is honeysuckle. This area could be planted with bur oak and swamp white oak to add diversity and improve the benefits to wildlife.

Site Preparation-

The undesirable species, including honeysuckle should be cut. Treat the stumps with Pathfinder II to prevent sprouting.

Oak Planting -

Plant the open areas with bur oak and swamp white oak. Plant the trees 30 ft. apart, or 50 trees per acre. 100 trees can be planted on the area. Place a 4 ft. tall vented shelter on each tree to protect them from deer and rabbits.

Control competing vegetation by spot spraying a combination of Roundup and Princep 4L herbicides. Protect the seedling from the spray and spray an area 4 ft in diameter around each tree. Apply 2 quarts of Roundup and 4 quarts of Princep 4L per

acre treated. The herbicides must be applied when the vegetation is actively growing. Control competing vegetation for a minimum of 2 years.

Stand 6: 6 acres

Viewshed Management -

Stand 6 is a natural white pine stand. This area naturally seeded 35-40 years ago. There are scattered elm, walnut, ash, cherry, and red oak. The trees are 5-10 inches in diameter. The stand is overstocked and the trees are being stunted. This area could be thinned to improve the health of the trees and maintain diversity. Selecting a variety of hardwood species along with the white pine to release will increase the diversity of tree species.

Timber Stand Improvement (Crop Tree Release) -

Select a "crop" tree every 30 ft. apart. Species to target for crop trees are white pine, red oak, walnut, and cherry. Remove trees with crowns that are touching or overtopping the crowns of the crop trees. The trees to remove can be felled or double girdled.

HIGH PRIORITY PROJECTS

1. Walnut Harvest – Stand 4, 11 acres
   Harvest 37 walnut that are poor quality, damaged, or mature.

2. Timber Stand Improvement (Weed Tree Removal) – Stand 4, 11 acres

3. Timber Stand Improvement (Crop Tree Release) -
   Stand 1, 18 acres
   Stand 6, 6 acres
   Stand 3 – Release scattered pole sized oak in viewshed area.

4. Oak Planting – Stand 5, 4 acres

APPENDIX

EXPLANATION OF TIMBER MANAGEMENT PRACTICES:

Timber Stand Improvement:

Timber stand improvement (TSI) is the removal of undesirable or low value trees. Removing these unwanted trees will provide more space and sunlight for desirable trees to grow. Timber stand improvement is a "weeding" to increase the growth of your forest.

Weed Tree Removal-

In older timber, the undesirable species can be killed to encourage the natural reseeding of desirable species. The removal of the "weed" trees allows sunlight to reach the ground so that seedlings can become established. The undesirable species can be killed standing by cutting flaps in the trunk and applying Tordon RTU or Pathway into the cuts. The cuts must be in a circle around the trunk and overlapping. The trees can also be cut off and the stumps treated with Tordon RTU or Pathway to prevent resprouting. Wet the outer rim of freshly cut stumps. The work can be done anytime except spring during heavy sap flow.

Desirable trees that are poor formed or damaged should also be removed. These trees should not be treated with herbicide. The stumps will resprout and produce another tree. Cut the stumps close to the ground so that the sprout will originate near the ground.

Crop-Tree Release-

In pole-sized stands (4-10" dia.), potential crop trees can be selected and released. At maturity, there is room for 35-50 trees per acre. Now you can select the trees you want to comprise your future stand of mature trees and thin around them to give them more growing space. Select a crop tree every 30-35 ft. apart. Remove trees with crowns that are touching or overtopping the crowns of your crop trees. Crop trees can be selected based on criteria that meets your objectives. Normally, the crop trees will be a desirable species, show good form without large side limbs, and be free of major defects. Species normally favored are black walnut, red oak, white oak, white ash, basswood, cherry, and hard maple.

Walnut Pruning-

Walnut trees that are 2-12" in diameter can be pruned to promote veneer quality trees. You should prune during the dormant season. Limbs less than 1 inch in diameter are providing foliage which produces food for the tree and should be left. When the limbs approach 1 1/2 to 2" in diameter, they should be removed. Do not remove over 1/3 of the live crown in any one year. At least 50% of the total height of the tree should be maintained in live crown.

Harvest:

Uneven-Age Management:

Uneven-age management can be implemented to manage shade tolerant species. The timber is selectively harvested to remove mature, damaged, and defective trees. Because large trees are always present in the timber, only species that can grow in the shade can reproduce. Hard maple and basswood can be managed on an uneven-age system of management. Uneven-age management involves maintaining a good distribution of all tree sizes in your timber. It is critical that following a selective harvest, the smaller trees are thinned to remove the trees damaged by logging, poor formed trees, and low value species. The thinning following the harvest insures that you have high quality trees ready to replace the older trees as they are harvested.

Even-Age Management:

Even-age management involves a clearcut at some point in the stands rotation. Clearcutting creates full sunlight to the ground. All trees 2" and larger in diameter are felled. Oak, ash, hickory, and walnut require full sunlight to grow. Even-age management must be applied to successively manage these species. Clearcutting creates stands of trees all the same age. The trees compete equally for sunlight and are forced to grow straight and tall, resulting in high quality timber. Clearcutting also provides excellent browse and cover for wildlife.

Shelterwood:

Shelterwood is a form of even-age management. The final cut is a clearcut, but several thinnings are done prior to the final cut. The large, healthy trees are left to provide seed for naturally reseeding the stand, and to create partial shade to inhibit the growth of weeds and brush until the desirable seedlings are well established. The final cut or clearcut is normally done when there are a sufficient number of desirable trees that are 3-5 ft. tall.

The first thinning can be a killing of the undesirable species such as ironwood, elm, bitternut hickory, and boxelder. This removes the seed source for the undesirable species and opens up the ground to sunlight.

The mature and defective trees can be harvested if additional sunlight is needed for the development of desirable seedlings. The harvest should be light, removing the trees that are deteriorating and leaving the high quality trees for seed.

The shelterwood system can take many years to develop a good stocking of desirable young trees. You may have to kill the undesirable species several times to favor the species you want. The final clearcut should not be made until you are satisfied with the stocking of desirable young trees.