2nd DRAFT (Nov. 8, 2007)

MCFARLAND SCHOOL FOREST
FOREST STEWARDSHIP PLAN

Name(s) and Address of Landowner(s):

McFarland School District
5101 Farwell Street
McFarland, WI 53558

Landowner: Indian Mound Park
Village of McFarland
5915 Milwaukee Street
McFarland, WI 53558

Indian Mound Park is included as part of McFarland School Forest through a Land Use Agreement adopted by the McFarland Village Board and the McFarland School Board on June 5, 2007.

County: Dane **Town Name: Dunn**

Town: 6N; Range 10E; Section 3 **Total Plan Acreage: 16 acres**

This forest stewardship plan provides guidance for woodland management on the McFarland School Forest. This guidance may be amended with approval by the DNR forester and a representative of the McFarland School District. A summary about the Wisconsin School and Community Forest Program and its benefits can be found at http://www.uwsp.edu/cnr/leaf/schoolforest/registration.shtml

This is a 10-year forestry plan. The objectives of the McFarland School Forest are as follows:

Education Studies: Continue to use the school forest to teach about our natural environment and to promote environmental stewardship through education on proper forest and ecosystem management with an emphasis on oak savanna and other native WI communities found in the school forest.

Historical/Cultural: Preserve and protect the Indian mounds, known as the Lewis Mounds Group. Educate students about Native American history and culture.

Forest Management: Harvest trees when recommended to promote forest health, maintain and restore native plant communities, and provide wood products. Maintain an uneven age timber stand for overall ecosystem health and longevity.

Wildlife: Maintain a diversity of trees, shrubs and forbs to provide habitat for a variety of wildlife.

Aesthetics: Maintain the health of the native ecosystem for aesthetic enjoyment.

Recreation: Maintain hiking trails throughout the woods; maintain a diverse ecosystem that will encourage passive recreational activities such as bird watching and photography.

Watershed/Water Quality: Follow Wisconsin's Forestry Best Management Practices for Water Quality. Minimize exposure of bare soil to minimize soil erosion.

Control Invasive Species: Use Best Management Practices (BMPs) for controlling invasive species; prevent new infestations from occurring through continued education and monitoring efforts.

General Forestry Information

Oaks: Oak trees, which are valuable wildlife species, are becoming less common in the forests of southern Wisconsin. Historically, oaks have been part of oak savannas or oak woodlands. Now there is a gradual conversion to more shade tolerant species, such as black cherry, hickory, elm, boxelder, and in some areas, maple and basswood. This conversion is a result of a lack of fire due to European settlement and modern fire prevention, high deer population, invasive species, and lack of proper woodland management. In the past when fires were common, oak trees survived fires and grew well. Now, oaks tend to get shaded out by brush and more shade tolerant trees. However, landowners can follow practices in this plan to restore an oak savanna and keep oaks in their woodlands along with a variety of other desirable tree and shrub species.

Oak wilt: No harvesting should occur in stands containing oak from March 1 to November 1 because of the possibility of infection with the oak wilt disease. It is during that time that the insect that carries the fungus (which is a close cousin to the fungus responsible for Dutch elm disease) is active and may be attracted to fresh wounds on oak trees. For the same reason, no pruning or thinning should take place with oak during that time frame.

Best Management Practices: Follow "Wisconsin's Forestry Best Management Practices for Water Quality" (DNR publication: PUB-FR-093 2003). The field manual lists practices landowners, loggers and land managers should use to protect water quality during forest management activities. Practices addressed include maintaining harvesting equipment to prevent spills and controlling soil erosion on logging or recreation trails. Of particular interest will be erosion control methods because of the steep slopes in the park and because of the proximity to the wetland in Thurn Marsh Park. Exposed soil must be seeded to establish vegetation cover. To prevent impacts to mammals and plants, forest management activities such as harvesting that includes the use of wheeled or tracked vehicles, should operate only during the dormant season (November 1 – April 1) and when the ground is firm (dry) or frozen.

Gypsy Moth: The gypsy moth, an invasive species and present in southern Wisconsin, is an insect that severely defoliates (eats the leaves of) "preferred" trees, such as oaks, aspens, basswoods, white birches, tamaracks and willows. Pines and spruces can be defoliated if in proximity to preferred hardwoods. Heavy defoliation from gypsy moth outbreaks will occur about every 10 years. Defoliation of your forest can result in tree death, but with proper forest management, it does not have to. First of all, mortality is typically the result of multiple stresses occurring together. Defoliation, drought, windstorm, other insects, diseases and over-crowding of trees are all tree stressors. Managing your forest to keep trees healthy is your best defense in reducing losses from gypsy moth outbreaks. Completing the thinnings and harvests that are scheduled in your management plan will promote vigorous growth and tree health. While beneficial, thinning and harvesting can cause short-term stress, so avoid these practices within a growing season of heavy defoliation or drought. Secondly, maintain a diversity of tree species increasing the proportion of species that are not preferred or avoided by the Gypsy Moth. "Non-preferred" species include maple, hickory, black cherry, black walnut, pines and spruces. Tree species "avoided" by the gypsy moth include ash and white cedar. The Gypsy Moth usually has little impact on conifers in pure conifer stands.

Prior to establishing a harvest or thinning, you should conduct a survey of gypsy moth egg masses. If sampling indicated a density of gypsy moth egg masses greater than 1,000/acre, you should delay harvesting or thinning until the outbreak is past and the trees have recovered. Aerial spraying to suppress an outbreak may be an option for protecting regeneration or high value timber. Information on the gypsy moth, how to predict outbreaks and the DNR suppression spray program is available from your local DNR forester.

Property Lines: Property lines should be regularly maintained for general forest management and to help prevent misunderstandings when harvesting or conducting woodland maintenance along a property boundary. Where there are no fences, steel posts at intervals of 100 feet along the line serve as good semi-permanent markers. Painting the tops with bright orange or red paint will make them easier to find later. For property lines adjacent to residential lots, strategically plant native shrubs to provide screening between public and private property.

Wood Utilization: No firewood or other trees may be removed from the School Forest area without the prior consent of the School Forest Committee. Trees that are cut for forest management purposes that create firewood of any commercial value can be sold to the public to fund school forest management projects. Trees selected for harvest by the DNR may be used by the school district for educational use (i.e. wood for shop classes).

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Terminology: Forestry related terms that may be used in this plan are defined below.

Forester – an individual trained in the science of forestry with a thorough understanding of the forest ecosystems in which they practice. Such an individual will typically have college education in the forest sciences.

Logger – an individual with an understanding of the practice of felling designated trees efficiently and carefully removing them from the forest.

Harvest – the cutting of standing trees that have merchantable value because they can produce logs, pulp, or other forest products.

Stand – an area with similar timber conditions that is useful to describe and manage the area.

Basal area – a measure of how crowded the trees are in a stand. It is the total cross sectional area of all trees in an acre, expressed in square feet per acre. For example, a 14-inch tree's cross sectional area is approximately one square foot. Basal area for hardwoods commonly range between 60 and 120 square feet per acre.

Thinning – a cutting where some of the trees in a stand are cut to reduce the basal area and encourage better growth of the remaining, or residual trees. If the trees that are thinned out are large enough to have commercial value, this may be termed a "harvest".

Pruning – the removal of lateral (side) branches from the stem of a tree to encourage growth of clear (knot-free) wood
of higher economic value. Typically, the first 17 feet of a tree are pruned to produce a clear 16' log.

Mature, overmature – when applied to trees, mature refers to the point in life when growth has become extremely minimal due to age. An overmature tree has passed the point of maturity and may begin to decline, with such indicators as decay and increasing numbers of dead branches in the crown of the tree.

General Property Description

The McFarland School Forest is located adjacent to the Indian Mound Middle School and McFarland High School in the Village of McFarland; see the attached Forest Stewardship Plan Map. The woods are surrounded by residential housing to the north, south and west, and school buildings and athletic fields to the east. The northern 10 acres of the school forest is owned by the Village of McFarland. The southern 6 acres are owned by the McFarland School District.

This school forest consists of hiking trails, mature woods, young woods, wetland, Indian mounds, and opportunity for oak savanna restoration. This provides an exceptional opportunity for students to study a diversity of environments, natural community types, and wildlife habitats and learn about sustainable forest and ecosystem management. Student classes are held in these diverse environments. The school forest is mostly upland with a lowland forest and open marsh component in the southwest portion. Surface soils are primarily loam and silt loam with slopes ranging from 0-20%; see the attached Soils Resource Map and Descriptions for details.

Indian Mounds
There is a significant group of Indian mounds located on the school forest, known as the Lewis Mound Group (47DA74). These mounds have exceptional cultural and historical value. This site was listed on the National Register of Historic Places in 1984. The National Register boundary includes the entire hill ending near the base or just above the private parcels with houses that surround the bluff. Because the site is listed on the National register and is publicly owned, all soil disturbing activities on the mounds or within 15 feet of the base of a mound must be reviewed by the Wisconsin Historical Society. See Appendix A: Indian Mound Guidelines and Map of Lewis Mound which has guidelines that must be followed when conducting forest management activities listed in this plan. The document, "Assessment of Current Conditions and Recommendations" for the Lewis Mounds Group provides detailed restoration and protection guidelines for each mound; this document can be obtained from the School District's School Forest Coordinator or on the School District's website, www.mcfarland.k12.wi.us.

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Natural Heritage Inventory
During a search of Wisconsin's Natural Heritage Inventory (NHI) database, two species were found on the list; the Prairie Vole and the Yellow Giant Hyssop.

- The Prairie Vole *(Microtus ochrogaster)* is a Wisconsin "Special Concern" mammal with no laws regulating use, possession or harvesting. (A species of special concern concerns those species about which some problem of abundance or distribution is suspected but not yet proved. The main purpose of this category is to focus attention on certain species before they become threatened or endangered.) The prairie vole is found in dry grassy areas along fence lines and open fields; sandy prairies and slopes, especially if weed or grass grown; abandoned farm fields; seldom is sparsely wooded area. Preferred habitat seems to be native prairie sod, of which there is little left in the state of Wisconsin. It avoids marshes and wet places. Semi-colonial, this species breeds throughout the year with a peak in July, August and September. Native plant assemblage associated with Oak Savanna will provide critical habitat for this species.
- The Yellow Giant Hyssop *(Agastache nepetoides)* is a Wisconsin "Threatened" plant. (Threatened means it appears likely, within the foreseeable future, on the basis of scientific evidence to become endangered.) The yellow giant hyssop is found in open woods and woodland edges and flowers from July through October.

To prevent impacts to mammals and plants, forest management activities such as harvesting that include the use of wheeled or tracked vehicles, should operate only during the dormant season (about November 1- April 1) and when the ground is firm (dry) or frozen.

Stands - Management Areas
Four stands were identified during a tree inventory of the school forest. A "stand" is an area with similar timber conditions that is useful to describe and manage the area. Details of the management recommendations are found under each stand description.

Practices for All Stands

Priority Practices

- Remove hazard limbs or trees. Along the trail system in the woods, there may be occasional hazard trees or limbs that should be removed. These can be entire trees or portions of a tree that are dead and could break off and fall on a passerby at any time. Some trees could just be trimmed while others may need to be cut down. An assessment of hazard trees should be made once each year and after large wind or ice storms. The DNR forester can assist with identifying hazard trees. Where dead trees occur away from trails, a certain number should be left standing as they are beneficial to wildlife.
- Control invasive species While removal of all invasive species is recommended, garlic mustard, honeysuckle, buckthorn, and oriental bittersweet are a priority because they are adversely affecting the natural ecosystem and they spread rapidly. See Appendix B (attached), for details on recommended control methods for invasive species. Due to the watershed area, non-chemical control methods should be favored, with herbicides as a secondary means when mechanical controls are ineffective.

Secondary Practices

- Preserve the Indian mounds and the reburial site. The following practices are taken from the document "Assessment of Current Conditions and Recommendations" for the Lewis Mound Group. Refer to the assessment document for specific practices for each mound.
  - Change trail locations where needed to at least 15-feet away from any Indian mound. Place logs and brush to block closed trails; check for and pull and garlic mustard plants before placing brush.
  - Stabilize old and new trails to stop erosion with vegetation seed and/or mulch. It may be desirable to cover the new trails with material that helps not only to stabilize them but also clearly marks them as the "official" routes. Vegetation replacement should be appropriate for the current use, or planned restoration.
  - Some trails that cross mounds have caused depressions in the mound. After these trails have been closed, repair the depressions by filling them in with "clean" soil.
  - Remove dead trees and trees growing on the mounds or within 15 feet of the mounds. The area should be reseeded with appropriate vegetation, or vegetation that will stabilize the surface of the mound and keep woody vegetation from returning. The visible outline of the mound should be reserved.
    - Tree removal should be done during frozen or firm (dry) ground conditions.
    - Trees growing on mounds should be hand cut, or cut with a machine that can stay at least 15 feet from the mounds.

- The trees should be cut close to the ground and stumps should be left intact. The stumps can be treated with chemical to prevent regrowth.
- During tree removal, trees should not be dropped or dragged across the mounds, and machinery and other vehicles should not be driven across the mounds.
- The logs and other material should be hauled away or scattered or piles at least 15 feet from the defined burial area or mound.
- Signage. The installation of signs is recommended at all entrances to the mounds area that introduces people to the Native history of the area, the importance of the mounds, and the protections provided by law.

Stand 1: 7 acres, O 15+[2] / CH 5-11[1]
Oak large sawtimber over central hardwood poletimber

Stand Description

A water tower with an access road is located in the north-central portion of this stand at the highest point on the school forest. Historically this stand was likely an oak savanna due to scattered large "open grown oaks" that have large branches growing low to the ground, or have remains of these large branches. Also, this stand has the majority of Indian mounds on the school forest, including a reburial site as shown on the map in Appendix A. The reburial site is from when a human burial and artifacts were found and moved to the reburial site when the water tower was built in the late 1990's. The stand has west, south and east facing slopes of 1-20%. The soil is primarily Military loam as described in the "Soils Resources Map and Descriptions" at the end of this plan. This 120-year old stand is dominated by a medium stocking of oak large sawtimber (15+ inches in diameter). The volume of large and small sawtimber is 3,800 board feet per acre. The stand has a basal area of 73 square feet per acre.

- Small and large sawtimber species are bur oak, white oak and red oak, hickory, hackberry, basswood, and walnut. The quality of timber is good.
- The secondary timber type is central hardwoods poletimber (5-11 inches in diameter). The volume of poletimber is 5 cords per acre. Poletimber species are black cherry, black walnut, basswood, hackberry, red oak, white oak, hickory, ash, mulberry and boxelder.
- Seedling and sapling species (0-5 inches in diameter) are ash, basswood, red oak, hackberry, hickory and elm.
- Invasive species include buckthorn honeysuckle, garlic mustard and oriental bittersweet. Much work has already been done to control these invasive species.

Stand Analysis

This stand was likely an oak savanna before European settlement. Oak savannas and prairie once covered a large portion of southern Wisconsin. They provide a unique habitat of plants and associated animals; often these are rare species. Oaks comprise 50% of the trees in this stand (bur, white and red oak). Oak savannas (or oak openings) have a maximum 50% tree canopy, intermittent oaks spaced singularly or in clumps (1-15 per acre), occasional shagbark hickory and hackberry trees, and an undergrowth of prairie plants. It is recommended to restore this stand to an oak savanna because:

1. Mature oaks exist to create the 50% tree canopy and the site is favorable since a majority of the stand faces south;
2. Having an oak savanna on the school forest would be a unique ecosystem to compare with the ecosystem of a more common central hardwood stands; and
3. The McFarland community supports an oak savanna restoration and has already begun clearing trees, burning, and planting prairie plants on a portion of this stand.

Management Objective

The objective for this stand is as stated in the Indian Mound Park Management Plan (attached): "…to restore and preserve the natural ecological values by maintaining the diversity of community types found here and to preserve the Indian Mounds in the park."

Priority Practices

- Remove hazard limbs or trees. For details, see the previous section "Practices for All Stands".
- Control invasive species. For details, see the previous section "Practices for All Stands".

Secondary Practices

- Preserve the Indian mounds. For details, see the previous section "Practices for All Stands".
- Control invasive species. For details, see the previous section "Practices for All Stands".
- Restore the oak savanna. Practices to restore the oak savanna are:
    - Conduct a timber sale. With guidance from experts in oak savanna restoration, the DNR forester and DNR ecologist will select trees for harvest, leaving trees that are desirable in an oak savanna community and/or have significant ecological value. Trees not selected for harvest will be marked with green "leave" paint, on sides facing away from trails, to preserve aesthetic value of the forest. All other trees will be harvested as part of a commercial timber sale. This harvest will coincide with the harvest of trees on the Indian mounds. The DNR forester is available to administer the timber sale, including sending out a timber sale prospectus to loggers to bid on the sale to achieve the best price for the timber.
        - Seek approval for conducting practices within the Natural Register boundary.
        - Follow all guidelines to protect the Indian mounds.
        - Do not harvest from March 15 to August 15 to minimize the spread of oak wilt.
        - Follow "Wisconsin's Forestry Best Management Practices for Water Quality", which includes practices to control soil erosion.
        - Consult with an ecologist about the appropriate number of snags, if any, to leave for wildlife while marking the timber sale.
    - Conduct prescribed burns on a regular basis to encourage native prairie and woodland plants and reduce invasive species.
    - Plant seeds of prairie plants.
    - Plant tree seedlings to provide an uneven age stand of oak savanna species.
    - Promote wildlife habitat. Dead limbs on oaks should also remain if not hazardous.

Stand 2: 3 acres, CH 15+[3] / CH 5-11[1]
Central hardwood large sawtimber over central hardwood poletimber

Stand Description

This NW portion of this stand contains a portion of 2 Indian mounds. Slopes are south-facing at 1-12%. Soils are mostly silt loam with medium to high fertility. This 90-year old stand is dominated by a good stocking of central hardwood large sawtimber (15+ inches in diameter). The volume of large and small sawtimber is 5,900 board feet per acre. The basal area is 80 square feet per acre. The northern half of this stand was once a tree nursery.

- Small and large sawtimber species are black cherry, black walnut, ash, silver maple, Norway maple, white oak, tamarack, elm and boxelder. The quality of timber is good.
- The secondary timber type is central hardwoods poletimber (5-11 inches in diameter). The volume of poletimber is 4 cords per acre. Poletimber species are black cherry, black walnut, hickory, ash, elm and boxelder.
- Seedling and sapling species (0-5 inches in diameter) are ash, hickory, elm and boxelder.
- Invasive species include boxelder, buckthorn, honeysuckle, garlic mustard, grapevine and oriental bittersweet. Much work has been done within the past year to control these invasive species.

Stand Analysis

- Regeneration: Young trees will become the future forest when the existing large trees are gone. The young trees in this stand consist of desirable and undesirable species. The most undesirable tree species are boxelder that should be removed since they are invasive and can crowd out species more desirable for wildlife and timber value. The most desirable existing young tree species for wildlife and timber value are black walnut and black cherry. These most desirable tree species should be "released" by cutting less desirable trees around them that are touching their branches and competing for space and sunlight.
- Basal area and harvesting: The average basal area in this stand is 80 square feet per acre. (Basal area is a measure of how crowded the trees are.) A central hardwood stand with a basal area of 115 or higher is considered too crowded for optimum growth. While the trees in this stand are not too crowded at this time, scattered black cherry sawtimber trees are in decline and should be selectively harvested soon as part of an improvement harvest, preferably at the same time as the trees in stand 1 are cut.

Management Objective

Maintain tree health, a diversity of tree species of an uneven age grouping, and timber products through selective timber harvesting and tree planting. Also, establish additional desirable tree species, such as sugar maple, bur oak, white oak and red oak.

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Priority Practices

- Remove hazard limbs or trees. For details, see the previous section "Practices for All Stands".
- Control invasive species. Oriental Bittersweet is a priority to control in this stand, as there are many large vines that are girdling trees. Vines should be cut at the base and treated with herbicide to prevent re-growth. Vines will decompose and will eventually fall from tree branches. Do not pull vines out of trees, as this can dislodge tree branches, and cause serious injury! Trees that are girdled and deformed by vines should be removed. For details, see the previous section "Practices for All Stands".

Secondary Practices

- Preserve the Indian mounds. For details, see the previous section "Practices for All Stands".
- Plant tree seedlings. In open areas created by removing invasive species, plant tree seedlings of desirable species if there is not already adequate regeneration. Plant white oak, bur oak, red oak, black walnut and sugar maple. For detailed information, see the section "Guidelines for Planting and Protecting Tree Seedlings" near the end of this plan.
- Plant Cover Crop. To reduce erosion and prevent the growth of unwanted plants in open (sparsely vegetated or bare ground) areas created after invasive species removal or following a timber harvest, the ground should be re-seeded with native vegetation appropriate to the site's conditions. An ecologist or other expert can be consulted to determine the appropriate seed mixture.
- Promote wildlife habitat.
    - Squirrels, large birds and other wildlife will be abundant as long as there are nut-bearing trees like oaks, hickories and walnuts.
    - Leave two to four standing dead trees, or "snags", per acre to provide shelter for cavity nesting wildlife as well as a food source for insect-feeding songbirds.
    - Use waste logs, branches, and brush from improvement cuttings to form brush piles. Brush piles provide shelter for rodents, rabbits and other small mammals and songbirds. Leave and encourage large rotting logs lying on the ground for more diverse habitat. Plant wildlife shrubs for additional food and habitat.
- Conduct a selection harvest by 2017. This harvest will give small and large trees of good quality more room to grow by removing poorer quality, over-mature, diseased and other at-risk trees. Openings will provide sunlight for natural regeneration or planting of desirable trees. This harvest can coincide with the removal of trees on the Indian mounds and for the oak savanna restoration. Many valuable black trees are in decline and ready to be harvested immediately. This harvest must use the following guidelines:
    1. Seek approval for conducting practices within the Natural Register boundary.
    2. Follow all guidelines to protect the Indian mounds.
    3. Do not harvest from March 15 to August 15 to minimize the spread of oak wilt.
    4. Follow "Wisconsin's Forestry Best Management Practices for Water Quality", which includes practices to control soil erosion.
    5. Maintain an average basal area of 60-80 sq. ft. per acre, except where needed to clear trees off of Indian mounds.
    6. Harvesting order of removal:
        - Remove poorly formed trees (crooked, leaning); trees injured by insects, disease or bad weather; and over-mature trees (trees that are beginning to decay or will likely die within 10 years).
        - Remove better-formed trees if necessary to reach the target basal area. If possible, focus on areas where oak and other desirable seedlings, saplings and poletimber exist to create small random reforestation openings for young trees to grow in sunlight.
    7. When cutting trees, care must be taken to avoid damaging the residual trees – the trees that are not harvested.

Stand 3: 3 acre, O 11-15[3] / O 5-11[2]
Oak small sawtimber over oak poletimber

Stand Description

This stand contains Indian mounds #6, #7, and #8. The stand slopes to the north, northwest and northeast with slopes of 1-20%. The soil is primarily McHenry silt loam as described in the "Soils Resources Map and Descriptions" at the end of this plan. This 60-year old stand is dominated by a good stocking of primarily red oak small sawtimber (11-15 inches in diameter). The volume of large and small sawtimber is 2,600 board feet per acre. The stand has a basal area of 90 square feet per acre (60 square feet poletimber and 30 square feet sawtimber).

- Small and large sawtimber species are red and white oak. The quality of timber is good.
- The secondary timber type is red oak poletimber (5-11 inches in diameter). The volume of poletimber is 8 cords per acre. Poletimber species are red oak and black cherry.
- Seedling and sapling species (0-5 inches in diameter) are red oak, basswood and elm.

The northeast one-acre portion of the stand is mostly walnut and ash saplings with an understory of sumac.

Stand Analysis
The sawtimber trees are healthy and well-spaced but the younger poletimber trees are crowded and need a light non-commercial thinning.

Management Objective
Maintain the health and diversity of the stand through a crop tree release thinning. Special care should be taken to follow all precautions and practices to prevent the spread of oak wilt in this stand, as it had an infestation in 2005. The DNR forester should be consulted and approve any work prior to cutting trees.

Priority Practices
- Remove hazard limbs or trees. For details, see the previous section "Practices for All Stands".
- Control garlic mustard. For details, see the previous section "Practices for All Stands".

Secondary Practices
- Preserve the Indian mounds. For details, see the previous section "Practices for All Stands".
- Control invasive species. For details, see the previous section "Practices for All Stands".
- Conduct a non-commercial thinning. Cut poletimber size trees (5-11 inches in diameter) in crowded growing conditions, removing less desirable trees from around the healthiest, best formed trees, giving them more room to grow. Also cut trees where they are growing into the crown of healthy sawtimber trees. The DNR forester can mark the trees to thin out.
- Promote wildlife habitat. For details, see the description in Stand 2, "Secondary Practices".
- Plant native understory shrubs. These should be planted in strategic locations to provide screening between public and private lands.
- Plant Cover Crop. To reduce erosion and prevent the growth of unwanted plants in open (sparsely vegetated or bare ground) areas created after invasive species removal or following a timber harvest, the ground should be re-seeded with native vegetation appropriate to the site's conditions. An ecologist or other expert can be consulted to determine the appropriate seed mixture.

Stand 4: 3 acres, CH 11-15[1] / CH 5-11[1]
Central hardwood small sawtimber over central hardwood poletimber

Stand Description
This stand is on lowland directly adjacent to Thurn Marsh. This area is former pasture and was grazed up until the 1960's; most of the trees in this area are new growth since the grazing stopped. The soils are Marshan silt loam. The volume of large and small central hardwood sawtimber is 1,900 board feet per acre with a basal area of 60 square feet per acre.
- Small and large sawtimber species are white ash and box elder.
- The secondary timber type is central hardwood poletimber (5-11 inches in diameter). The volume of poletimber is 4 cords per acre. Poletimber species are ash, boxelder and hickory.
- Seedling and sapling species (0-5 inches in diameter) are ash and boxelder.
- Invasive species are primarily honeysuckle which is in the process of being removed.

Stand Analysis
The tree and shrub vegetation in this stand is mostly undesirable. Boxelder and honeysuckle should be removed because they are invasive. Ash trees have historically been desirable, but now there is concern that the emerald ash borer may kill most of them in Wisconsin within the next 10 years. However, as of the date of this writing (2007), the emerald ash borer has not been detected in Wisconsin but it has been found in northern Illinois.

Management Objective
Remove invasive species and replace with desirable trees, shrubs and forbs.

Priority Practices

- Remove hazard limbs or trees. For details, see the previous section "Practices for All Stands".
- Control invasive species. For details, see the previous section "Practices for All Stands".

Secondary Practices

- Monitor Ash trees. Ash trees should be closely monitored for signs of infestation from Emerald Ash Borer. Information is available from the DNR on symptoms to watch for, as well as identification of the insect and larvae.
- Plant Cover Crop. To reduce erosion and prevent the growth of unwanted plants in open (sparsely vegetated or bare ground) areas created after invasive species removal or following a timber harvest, the ground should be re-seeded with native vegetation appropriate to the site's conditions. An ecologist or other expert can be consulted to determine an appropriate seed mixture.
- Plant desirable tree, shrub and forb species. Plant species that grow well on lowland soils. Suggested tree species are bur oak, swamp white oak, yellow and river birch, tamarack, black spruce, and white cedar.

Guidelines for Management and Restoration Work in the School Forest

Any school class, individual, or group that participates in management activities (i.e. cutting invasive trees and shrubs, pulling garlic mustard) must be familiar with the goals of the management plan, as well as abide by the safety guidelines and information contained in *The McFarland School Forest Volunteer Handbook.* (This is available from the School District's School Forest Coordinator or on the School District's website, www.mcfarland.k12.wi.us). Volunteers should contact the School Forest Coordinator prior to working in the school forest to make sure they receive proper training and safety equipment.

Volunteers working in the areas around the Lewis Mound Group must be familiar with the maps, laws and regulations concerning the mounds, outlined in Appendix B of the School Forest management plan.

Guidelines for Planting and Protecting Tree Seedlings in Existing Woodlands

In open areas created by a timber harvest or removal of invasive species, determine if desirable tree species are present in the seedling or sapling size (up to 5 inches in diameter). These small trees will be the future forest when the older trees are gone. Desirable upland tree species (based on timber and wildlife values) in order of most desirable to less desirable are: oak (red, white and bur) black walnut, sugar maple, black cherry, basswood, hackberry, and hickory. If it is difficult to find any of these desirable species, plant desirable species at a:

(a) 12x12-foot spacing for small seedlings (8-16 inches tall), or
(b) 20x20-foot spacing for taller seedlings (18-24 inches tall).

In April, tree seedlings and shrubs can be planted by hand using a shovel or a planting bar that can be borrowed from the DNR. On school and community forests, free small (8-10 inches tall) seedlings can be ordered from the DNR beginning the October before planting. Tree can also be purchased from private nurseries. For black walnuts, you can also "direct seed". Gather the nuts in the fall (beginning a couple weeks after they first begin to fall off the trees) and place the nuts in the ground with one inch of soil covering the nut. They will sprout in the spring. It is helpful to place stake wire flagging next to each planted tree to locate later for release (to clear brush away) and to check for survival. Also, if seedlings are being browsed by animals (e.g. mice, voles, rabbits or deer), protect them with fencing or wrap/fold around the terminal (top) bud and stem with a dryer cloth or 5x7 size recipe card and staple close to the stem to hold it on.

If there is significant shade from brush or tall trees, and there are no plans to remove the shade, plant sugar maple and basswood – these trees can grow in moderate shade. If efforts will be made to clear brush from around seedlings or if there is no brush competition to begin with, plant the other tree species as well. When clearing brush around seedlings, either remove the brush and roots completely or spray the brush with herbicide to prevent them from resprouting. After planting, revisit the planting site to be sure the brush has not regrown, shading out the seedlings.

FOREST STEWARDSHIP PLAN

10 - YEAR FORESTRY PLAN PRACTICE SUMMARY

This table may be used as a work reminder, referring to the plan for details.

Phase	*Stand #*	*Practice*
1	1, 2, 3, 4	- Remove hazard limbs or trees along trails. - Control invasive species. - Block off trails that cross Indian mounds or the reburial site. Relocate the trails.
2	1, 2	Conduct a timber sale.
2	3	Conduct a non-commercial thinning.
2	4	Plant desirable trees, shrubs, forbs and cover crop in areas opened up from invasive species removal.
3	1	Plant prairie seeds.
3	2, 3	Plant desirable trees, shrubs, forbs and cover crop in areas opened up form invasive species and tree removal.
4	1	Maintain the oak savanna with prescribed burns.
4	2, 3, 4	Continue controlling invasive species.

Provide the name, address, and telephone number of the preparer of this plan:

Steve Holaday, Forester
Wisconsin DNR
3911 Fish Hatchery Road
Fitchburg, WI 53711
608-275-3234

To be signed by a representative of the McFarland School District

_____ _____
Signature Date Signed

_____ _____
Signature Date Signed

(Attach additional signature pages, if needed.)

Approved for the Department of Natural Resources by:

_____ _____
Signature of DNR Forester Date Signed

FOREST STEWARDSHIP PLAN MAP

McFarland School Forest

Owner's Name: McFarland School District	Town or Village Name: Dunn		County: Dane
Street or Route: 5101 Farwell Street	Township No.: 6 N	Range: 10 ☒ E ☐ W	Section: 3
City, State, Zip Code: McFarland, WI 53558	Acres: 16		

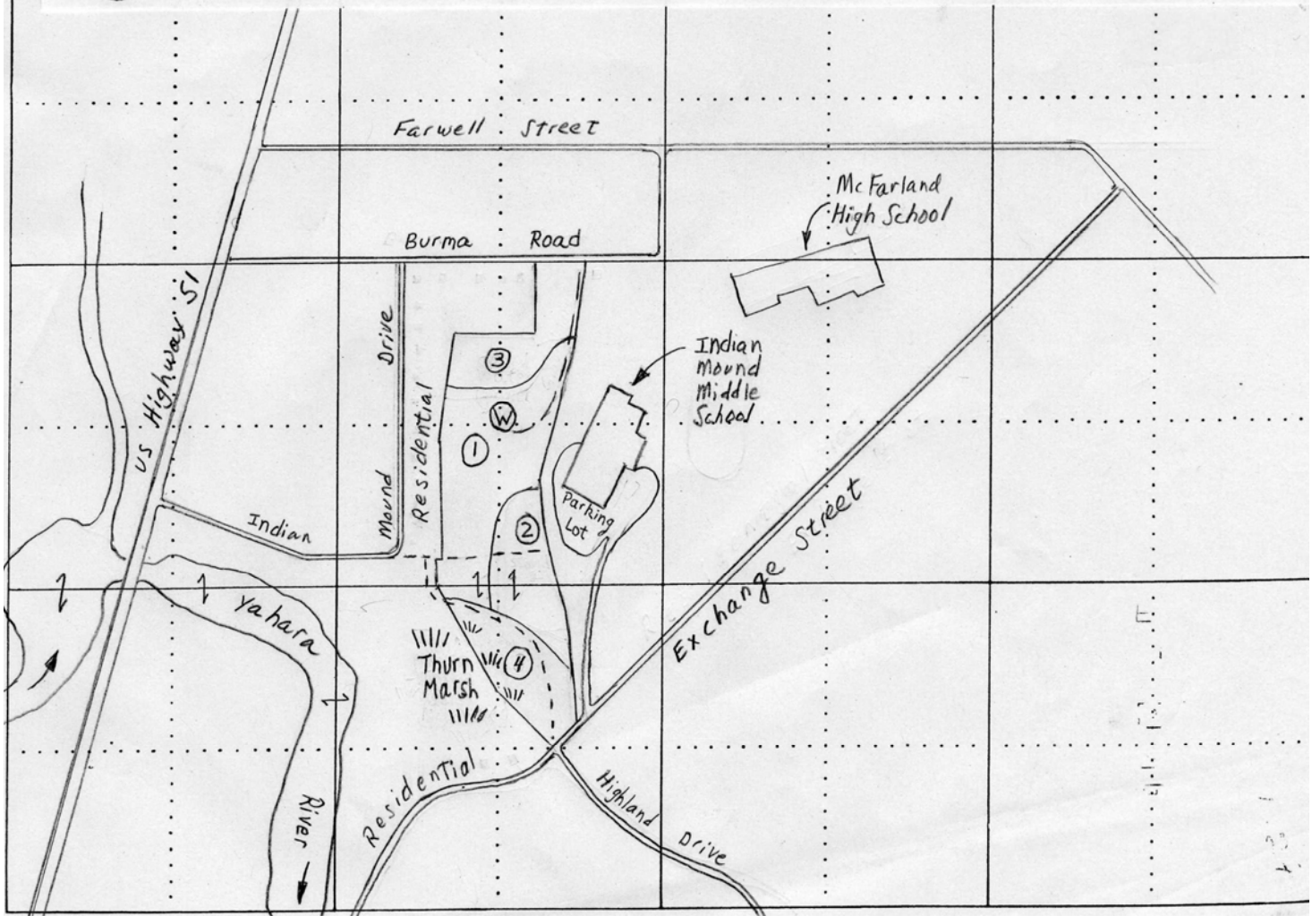
Section Diagram
8" = 1 Mile

N

Prepared By: Steve Holaday
Date: 8-27-07

LEGEND

(1) = Stand 1 = 7 acres, Oak large sawtimber, 15+ inches in diameter (O 15+[2] / CH 5-11[1])
(2) = Stand 2 = 3 acres, Central hardwoods large sawtimber, 15+ inches in diameter (CH 15+[3] / CH 5-11[1])
(3) = Stand 3 = 3 acres, Central hardwood small sawtimber, 11-15 inches in diameter (O 11-15[3] / O 5-11[2])
(4) = Stand 4 = 3 acres, Central hardwood small sawtimber, 11-15 inches in diameter (CH 11-15[1] / CH 5-11[1])
\\\\\ = Marsh
= Hiking Trail
= Gravel Driveway
(W) = Water Tower



Soils Resources Map and Descriptions
McFarland School Forest, Dunn Township, Section 13

This soils map aerial photo was taken in about 1970.

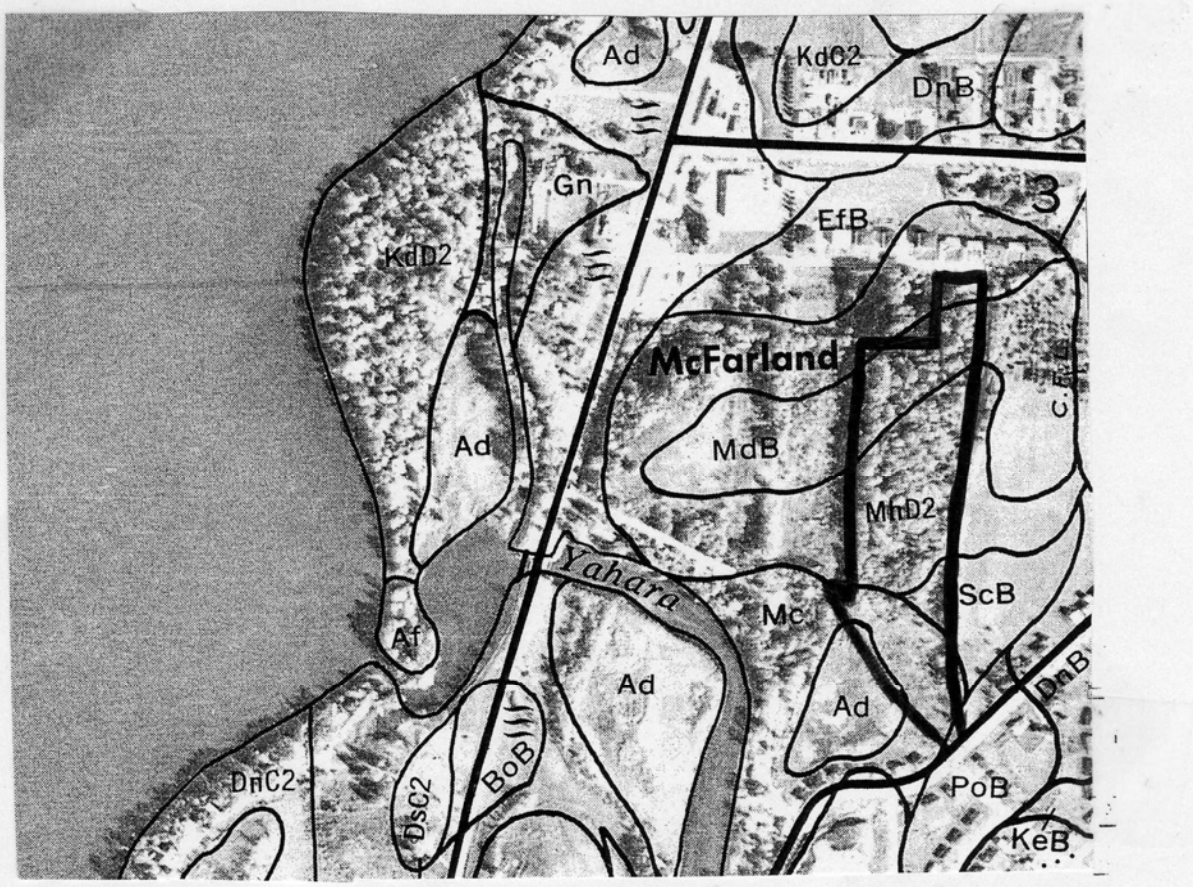
Ad - Adrian muck. Adrian muck consists of deep, poorly drained depressional areas of stream valleys. There are 30-40 inches of muck underlain by loamy sand and sand more than 3 feet thick. Fertility is low.

Mc - Marshan silt loam. Marshan silt loam is on low benches in stream valleys. Some areas pond water. The surface layer is black silt loam about 13 inches thick. The sub soil is 20 ijnches of silty clay loam and clay loam. The underlying material is sand. The soil is wet with medium fertility.

MdB - McHenry silt loam. 2-6% slopes. The McHenry soils are deep and well-drained glacial uplands. The surfa layer is about 7 inches of silt loam. The subsurface layer is about 26 inches of silty clay loam to sandy clay loam. The depth to calcareous glacial till begins at 24 to 40 inches. Soil fertility is medium.

MhD2 - Military loam. 12-20%, eroded. The Military soil is moderately deep, well-drained on glaciated uplands. These soils are in areas of shallow glacial drift where sandstone bedrock is exposed. The surface layer is loam about 5 inches thick. The subsurface layer is 24 inches of sandy clay loam over sandstone bedrock. Soil fertility medium.

ScB - St. Charles silt loam, 2-6% slopes. St. Charles soils consist of deep, well drained to moderately well draine soils on glaciated uplands. These soils formed in deep loess and loamy glacial till under mixed hardwoods. The loam surface layer is about 9 inches thick. The subsoil is about 41 inches thick of loam, silt loam, and silty clay loam. The underlying material is calcareous sandy loam till. Soil fertility is high.



APPENDIX A: Indian Mound Guidelines and Map of Lewis Mound Group

The Lewis Mound Group, an ancient burial site sacred to the Native Americans, (in Stands 1 and 2 of the McFarland School Forest) is listed in the National Register of Historic Places and is protected by law. All work done in the mound area (within a 5 foot parameter of the mounds, or potentially affecting the mound area) must be reviewed and approved by the Wisconsin State Historical Society's Burial Preservation office before proceeding. Site visits have been conducted by the state archaeologist and an initial report of recommendations is attached to this plan**. Anyone working in this area must be thoroughly familiar with the rules and regulations governing the mound area in order to avoid damaging the mounds in any way.**

Under Wisconsin law, Native American burial mounds, unmarked burials, and all marked and unmarked cemeteries are protected from intentional disturbance. If anyone suspects that a Native American burial mound or an unmarked or marked burial is present in an area, the Burial Sites Preservation Office should be notified. If human bone is unearthed during any phase of a project, **all work must cease**, and the Burial Sites Preservation Office **must be contacted** at 1-800-342-7834 to be in compliance with Wis. Stat. 157.70 which provides for the protection of all human burial sites. **Work cannot resume until the Burial Sites Preservation Office gives permission**. If you have any questions concerning the law, please contact Wisconsin Historical Society at 1-800-342-7834.

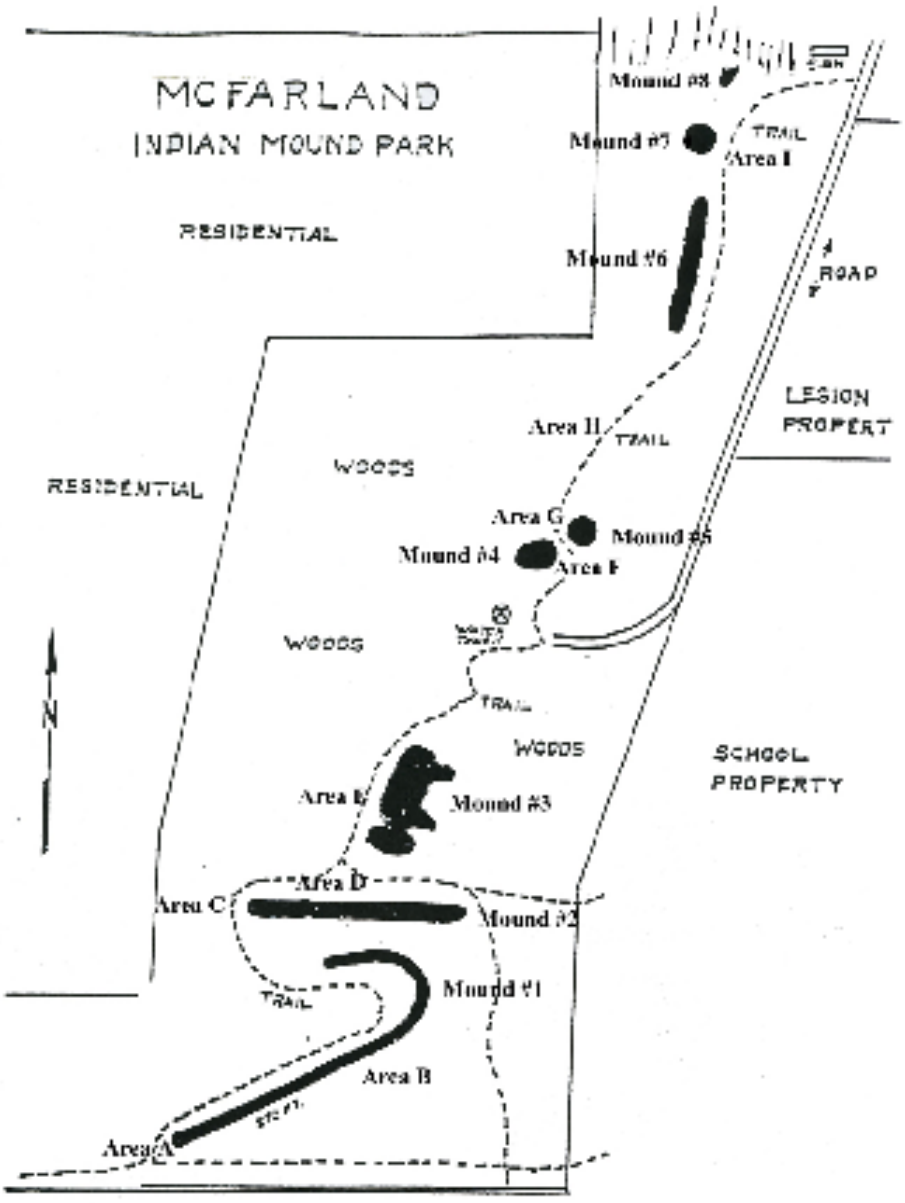
General rules regarding the mounds:

- No foot traffic is allowed on the mounds.
- No bicycle or snowboard activity is allowed on the mounds.
- Any work on the mounds (i.e. clearing unwanted brush) should be done when the ground is frozen. Avoid working in wet conditions.
- Any brush or trees cleared from the mound should be cut as close to ground level as possible. **Never uproot plants or shrubs on the mounds!**
- Any replanting of native plants or groundcovers on the mounds must be done by re-seeding only. Digging of any sort on the mounds is prohibited by law.
- Installation of any signage or fence posts in the proximity of the mounds must be approved by the Burial Protection Office before proceeding.
- Removal of trees of any size from the mounds must be done under the guidance and approval of the Burial Protection Office and DNR forester; procedures outlined in the management plan must be followed.
- Trees and brush must not be dragged over the mounds, and should be removed to at least 15 feet from the mound area.

Following these guidelines will ensure that this important historical treasure is honored, preserved and protected for future generations.

Appendix A continued

The Lewis Mound Group of Indian Mounds on the McFarland School Forest



APPENDIX B: Invasive Species Information and Control Methods

This is a list of the most common and problematic invasive plant species found in the McFarland School Forest. Information on each species and control method(s) is compiled from the DNR *Wisconsin Manual of Control Recommendations for Ecologically Invasive Plants.* Please refer to this appendix when working to eradicate or control invasives. More detailed information on each species, including color photographs, as well as general information on the use of herbicides, can be found on the Wisconsin DNR website: www.dnr.state.wi.us/invasives/pubs/manual_TOC.htm.

Garlic Mustard *(Alliaria petiolata)*
Garlic mustard, an exotic species introduced from Europe as a garden herb, is a rapidly spreading woodland weed that is displacing native woodland wildflowers in Wisconsin. Unlike other plants that invade disturbed habitats, garlic mustard spreads rapidly into high quality forests. It is a cool season biennial plant that ranges from 12 to 48 inches in height as an adult flowering plant. First year plants consist of a cluster of 3 or 4 round, scallop-edged crinkled leaves rising 2 to 4 inches high in a rosette. Germinating in spring, this first year plant will overwinter as an evergreen plant, often forming large green patches that are easy to identify when other native plants are dormant. The first year plants will produce flowering stems the following spring (May-June) that have numerous white flowers with 4 petals. If not removed, these flowers will go on to produce seedpods in late summer that release thousands of seeds and can be easily spread by animal and human activity.
Garlic mustard is hard to eradicate from an area once infested, and takes consistent vigilant effort over several years to control. **Areas with prior infestations should be monitored, and any new infestations promptly controlled.**
Garlic mustard plants can be pulled in the spring during the flowering stage BUT BEFORE SEED PODS FORM, using the following methods.

- Grasp plants firmly by the roots at soil level and pull steadily to remove the entire root-don't "yank" plants or they will break, leaving a root in the ground that can resprout.
- Place pulled plants in black plastic bags and tie tightly. Bags of garlic mustard must be land filled and should be placed with trash for collection. DO NOT TAKE TO YARD WASTE SITES OR COMPOST!
- Work thoroughly in an area; make sure to remove all plants.

The above non-chemical means can be very effective in small areas, or when large numbers of volunteers are available. Other means of control that can be used when this is not effective or practical include:

- Prescribed burning
- Herbicide treatment with 1-2% active ingredient glyphosate (Roundup) solution can be applied when other plants are dormant (late fall or early spring). Please refer to the above DNR manual for guidelines for herbicide use. Only trained adult volunteers should use herbicides, and all label directions and safety precautions must be followed. Care should be used to avoid contacting surrounding plants. Restricted use herbicides require a licensed professional for application.

Honeysuckle (*Lonicera tartarica, Lonicera morrowii, Lonicera x bella)*
Exotic bush honeysuckles are dense, upright deciduous shrubs with small (1-2") oval or oblong leaves that emerge very early in the spring, followed by white or pink small tubular flowers. Red berries follow in late summer, and foliage persists long into the fall after most native deciduous shrubs are bare. Honeysuckle can grow quite large; 3 to 10 feet or more in height, has a shallow spreading root system. The bark is a dull light brownish gray. Honeysuckle is particularly troublesome in woodlands as it produces dense shade and out-competes native plants and shrubs for water, light and nutrients. Often only bare ground is present underneath where honeysuckle has invaded.
Eradication methods that are effective include;

- Hand pulling or digging of smaller plants; since honeysuckle is shallow-rooted, pulling or digging of small plants when the soil is moist can be easily done. Tools such as a weed wrench, shovel, or mattocks can be used; soil that is disturbed after pulling should be tamped down.
- Stump cutting; Larger plants can be cut at or near ground level with either lopping pruners (for stems 2" or less in diameter) or bow saws. Power brush cutters are excellent for large areas. Cut stumps should be immediately treated with a 20% glyphosate (Roundup) solution by carefully spraying only the cut stump, brush or sponge application can also be used. This will prevent re-sprouting; this treatment works best in the fall when plants are moving nutrients down into the root system. Spring application can be effective, but stumps should be monitored, re-cut and treated if sprouting occurs.

Brush from clearing honeysuckle should be removed from the area that is being cleared and can be chipped in regular Village brush collections, or burned in a designated bonfire area with permission of the Fire Department.

Buckthorn (*Rhamnus frangula, Rhamnus cathartica)*
Both common and glossy buckthorn are tall shrubs or small trees that reach 20-25 feet in height and 10 inches in diameter. They often have multiple stems and dark gray bark with tiny lighter spots (lenticels). Older branches develop characteristic "thorns" and all have small oval leaves that emerge earlier and persist later than native trees and shrubs, making them easiest to identify and eradicate in late fall.
An invasive originating in Eurasia, buckthorns were imported as landscape shrubs. Buckthorn spreads rapidly by seed and forms dense thickets that shade out native herbaceous plants and shrubs, and interfere with native tree seedlings' ability to grow.
Effective control methods include:

- Pulling or digging small seedlings or saplings. This works best when the soil is moist. A weed wrench or small shovel can be helpful; tamp down disturbed soil after removal.
- Cutting larger trees. Larger trees and multi-stemmed shrubs can be cut with a pruner, bow saw, brush cutter, or chain saw. Treat stumps with 20% glyphosate (Roundup) to prevent re-growth.
- Prescribed burning In areas with large infestations, prescribed burning can be an effective means of control. This should be used in areas such as oak savanna (Stand 1), where prescribed burns are a recommended management practice.

Buckthorn may be chipped or burned. Care should be taken to keep branches with seeds out of uninfested areas.

Oriental Bittersweet *(Celastrus orbiculatus)*
This invasive vine from Asia is particularly widespread in Stand 2, where it has grown vigorously, winding around and girdling tree trunks, eventually killing and pulling them down . These vines can climb over 50 feet and can grow 6 inches or more in diameter. The vines have light brownish gray bark, leaves are rounded and glossy with prolific orange berries appearing in fall.
Control methods include:

- Cutting vines Vines should be cut at ground level and treated immediately with herbicide; a 20% glyphosate solution is effective. See DNR manual for other herbicide options if this is not effective. Vines will die and decompose quickly, and eventually fall out of trees. DO NOT PULL ON VINES!
  This could cause tree branches to dislodge and fall, causing serious injury. Vines that are easily accessible should also be cut with pole pruners further up and out of children's reach.
- Removing young vines Young vines and seedlings can be pulled or dug; areas with infestations of Oriental bittersweet should be closely monitored for new plants, and eradicated promptly.
- Trees that are severely disfigured or pulled down by vines should be removed. This should only be done by adult volunteers, who are familiar with chainsaw safety issues and have proper equipment.

Other Invasives
The following plants have been identified and found in the school forest area, but in smaller numbers than the above species. Nevertheless, they should be targeted for removal as soon as possible and all stands should be closely monitored for new invasives. A plant inventory list of all invasives in the school forest is available from the School Forest Coordinator. A full listing of Wisconsin's invasive plant species is available on the DNR website, along with more detailed and specific eradication methods for each. Further consultation with a DNR ecologist may be necessary to develop proper control strategies as new species emerge.
Control of these species at the early stages of infestation will prevent their spread and potential impact to the ecosystem in the future. It is easiest to control unwanted plants at this stage.

Purple Loosestrife (*Lythrum salicaria)*
Dame's Rocket (*Hesperis metronalis*) A close relative of garlic mustard, with showy purple flowers. Pull flowering plants in spring.
Multiflora Rose (*Rosa multiflora)*
Reed Canary Grass (*Phalaris arundinacea*)See detailed DNR information on eradication methods. Some methods (burning, herbicides) can be ineffective or lead to more vigorous growth if not done or timed properly.
Motherwort (*Leonurus cardiaca)*
Lily of the Valley (*Convallaria majalis)*
Canada Thistle *(Cirsium arvense***)**
Burdock *(Arctium minus)*
Poison Ivy , Poison Oak*(Toxicondendron radicans)* Occurs mostly in vine form on tree trunks in the school forest; leaves of this variety are notched and are more commonly known as "poison oak".