



3-Year Forest Management Action Plan

DUNCAN WOODS, MULLIGAN'S HOLLOW, GH CEMETERY AND AREA PROPERTIES

SYNOPSIS

The following is an action plan based on the prescription for forest and invasive species management on 200+ acres in the city of Grand Haven. A complimenting [Forest Stewardship Program](#) (FSP) management plan has been drafted and is pending submission to the Michigan Department of Natural Resources; the plan spans from 2022 - 2042. This action plan is outlined below by the areas of concern addressed in the FSP plan. The purpose of this document is to provide additional information to the decision makers responsible for implementing specific action based on the FSP plan drafted by Michigan registered forester (#3301046054) Brett Kuipers, Lead Forester and President of Michigan Forestry Company based in Holland, Michigan. Brett's full bio can be read at www.miforstry.com/credentials.

The FSP allows landowners to gain additional knowledge about their forest through engagement opportunities with different organizations such as the American Tree Farm System, Michigan Forest Resource Alliance, Forest Products Council, Hardwood Forestry Foundation, Michigan Department of Natural Resources, Forests For Fish, and Michigan Forest Association. Field days and other information is provided by these organizations. The FSP also provides grant opportunities for landowners seeking assistance with their forest land. Activities such as tree planting and invasive species control are included in the grant funds available. [Mike Smalligan](#), Forest Stewardship Program Coordinator for the Michigan Department of Natural Resources - Forest Resources Division, can provide more detailed information for landowners looking to leverage grant resources.

AREAS OF CONCERN FOR TREATMENT

1. **HEMLOCK WOOLLY ADELGID** [[Hemlock Woolly Adelgid - Invasive Species](#)]

As of January 2022, all hemlocks have been identified and treated with an injection of imidacloprid. The chemical should be reapplied in 5 to 7 years either as injection or soil drench.. A registered forester should monitor the tagged and treated trees in the in-between years to assess how the treatment is working in order to be proactive for the next treatment.

2. **OAK WILT** [[Oak Wilt - Invasive Species](#)]

Infected trees should be identified along with epicenters of oak wilt during the summer of 2022. Some trees have been identified previously in 2018, and presently. The arborist crew should GPS mark previously infected trees, and identify new trees with Oak Wilt. The estimated cost for a registered forester to walk the property acre by acre identifying infected, and possibly infected, trees in Duncan Woods, as well as the greater city of Grand Haven, is outlined in the last section of this action plan. Assessment of surrounding private properties and municipal owned woodlots in nearby areas will be completed if the scope warrants

that level of detail. Once the assessment is completed, treatment can begin as soon as possible by the arborist tree care crew from a reputable tree service.

In the winters of 2022-2024, depending on how many infected areas are found, the trees should be marked by the registered forester along with the 100 foot radius surrounding it. Felling (cutting down) of all red and black oak trees within 100 feet of the infected tree, or trees, should then be conducted. Next, the vibratory plowing can begin covering the circumference of the infected area in an attempt to slow the spread through root grafts. All material should be removed, and stumps should be sprayed with an herbicide to prevent sprouting and root grafting across the trench. This felling and trenching activity should be done when the trees are dormant (typically mid-October-early April). The most susceptible Oak Wilt period is April 15-July 15. Logging is not recommended though it would be effective to remove beech and oak trees. Logging in this dune landscape would present a higher risk of negative impact on the dune landscape than desired. Also, the terrain, blacktop damage, and equipment footprint would all be obstacles preventing the logistics of a logging operation. Tree trimming crews supervised by a registered forester would be the best option. Tree crews tasked with felling, leaving the trees in place to decompose, or removing the infected trees via a low impact vehicle such as an ATV, skid steer, or iron mule would be the best means of removing the infected material. A track machine harvester such as a Timco may also be a good option, but is a cumbersome expense. My recommendation would be to remove the material, or burn it in place.

A registered forester should monitor the woodlots and city for possible new Oak Wilt outbreaks. Staying ahead of the outbreaks will allow success of maintaining oak in the landscape well into the future. Beyond this three-year plan, a salaried registered forester for the city, or a contract with a registered consulting forester is recommended.

3. **BEECH BARK DISEASE** [\[Beech Bark Disease - Invasive Species\]](#)

As soon as possible, a registered forester should identify and scale infected beech bark diseased trees and mark them with a tag or paint. Forestry marking paint is more effective and will stay on the trees longer. Locations should be identified via GPS coordinates. Some locations have already been identified by Grand Valley State University staff and students. The first priority would be to locate the main infested area. Dr. Locher's report indicates trees per acre for all species. Red oak and beech are the most prevalent species on the property. Removal of 60-80% of beech, and any oak, within 100 feet of an infected area or tree would be removed. This removal will cause a large change in the look of the woodlot. However, the long term effect will give the oak a chance to survive, as well as some of the beech.

A registered forester should be utilized to identify highly susceptible beech trees. These include unhealthy suppressed trees, as well as trees with rough and fissured bark. The registered forester should also identify smooth barked non-infected trees for possible survival.

A removal bid process for a tree trimming crew to remove scale infected and possible susceptible trees throughout the entire forest should be initiated. This will remove upwards of 60-80% of the beech trees on the property. The registered forester should oversee the removal and execution of this project. Tree trimming crews supervised by a forester would be the best option for felling and removal. Tree crews tasked with felling and leaving the trees in place to decompose, or removing the infected trees via a low impact vehicle such as an ATV, skid steer, or iron mule are recommended. A track machine harvester such as a Timco may be a good option. However, renting this timber harvest equipment for a non-logging task can be cumbersome. My recommendation would be to remove the material, or leave it in place to decompose. Spraying the scale insects with horticultural oils, such as Bonide, to kill them is advised. Killing the new scale crawlers will be important to stop the spread of the scale.

Each year during this three-year project, a registered forester should inspect felled trees and newly dead beech trees for fungal pads caused by the secondary pest called nectria canker. Beyond this three-year project, this inspection should take place annually by a registered forester. Nectria has not been found as of yet in the woodlots. It will likely be present in the next 2-3 years, as it is a native pathogen living in the soil.

4. INVASIVE PLANTS

Currently, Tree of Heaven, Multiflora Rose, Autumn Olive, Japanese Barberry, and Honeysuckle have been identified as invasive species in the woodlot. A registered forester should revisit the map produced by Dr. Locher in 2018 that describes the location of invasive infestations.

A hack and spray approach is recommended for all species. Cutting the plants and leaving them at the base and spraying them with roundup will be an effective way of killing the plants, as well as slowing the spread through the forest.

5. DEER OVERPOPULATION

The deer overpopulation is not allowing regeneration in the understory. Deer browse is a major reason little tree species are growing in the understory. Managing the deer herd population must occur in order for oaks, cherry, hemlock, and other species to re-seed. Either fencing of trees, deer exclusion fencing, will aid in reducing the herd pressure on the trees plant species. If the deer are not dealt with as this older forest turns over in age, there will be low recruitment of northern hardwood species to replace the aging trees in the over-story. A way to show the public the deer herd needs to be actively managed is to fence off areas as deer exclusion zones. In a relatively short time, the difference to understory growth will become apparent.

Several approaches can be taken for effective herd control. A deer fence installation, where deer are pushed out and the fences are installed and maintained would be the most effective measure. After the fence is installed it would need to be monitored by staff members. Small or large deer exclosures allowing seedlings to establish with the absence of deer browse will be highly effective. This will be the most effective method, but costly. I will be happy to address other less costly options at the meeting.

If the deer population remains as high as currently numbered, even if action is taken to replace infected trees, it will be extremely difficult to regenerate the overstory in the short and long term lifespan of the forest.

6. EROSION

The trails present in stand one have differing degrees of erosion. Maintenance should be done to halt the erosion. Since multiple trails are present, shutting down one trail at a time for maintenance is an ideal way to minimize the public outcry during trail maintenance. In parts of the trail where water runoff is excessive, water bars can be installed to slow down the run off. In certain areas of extremely high traffic and excessive erosion, building a boardwalk could be an option to reduce disturbance. Laying logs along areas of trails where multiple paths are located can mitigate disturbance by blocking other routes that are not stable. A landscape/excavation crew should be hired to install and plant native trees and plants.

An optimal way to help stabilize the soils on top of the dunes is planting a variety of native species where root structure will stabilize the dunes. These species include beach grass, common reed, sea-rocket, sand cherry, little bluestem, blueleaf willow, white cedar, white pine, and many more. For a more complete list visit:

[List of Common Native Plants of Michigan Sand Dunes](#)

3-YEAR PROJECT COST ESTIMATE

Invasive species control cost estimates are for a crew of 2-4 tree workers and equipment supervised by the registered forester. (Real prices will be determined via a bidding process.) **These are estimates only.** Work seasons are defined as November through March for cutting, plowing, and spraying. The professional forestry services for administration is calculated at 15% of the total bid value and the hourly rate of \$100/hour beyond the scope of a

normal timber sale bid process. A registered forester with the State of Michigan that is in good standing with the Society of American Foresters is recommended.

Activity	Weekly Cost		Monthly Cost		Annual Cost		3-YEAR PROJECT	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Arborist tree care crew from tree service	\$7,500	\$15,000	\$30,000	\$60,000	\$150,000	\$300,000	\$450,000	\$900,000
Forester admin. @ 15%	\$1,125	\$2,250	\$4,500	\$9,000	\$22,500	\$45,000	\$67,500	\$135,000
TOTAL	\$8,625	\$17,250	\$34,500	\$69,000	\$172,500	\$345,000	\$517,500	\$1,035,000

1. FORESTER ADMINISTRATION

- a. Conduct a survey and map the known and new Oak Wilt and Beech Bark Disease infection locations in 2022
 - i. Forester is responsible for scouting and gridding the woods to identify new and known BBD/OW locations
 - ii. Forester is responsible for documenting and mapping known, new, and suspected OW, and BBD locations
- b. Paint the circumference of infected locations and delineate vibratory plow area
 - i. Mark confirmed Oak Wilt infected areas for removal
 - ii. Mark confirmed Beech Bark Disease infected areas for removal
 - iii. Survey and mark of invasive species for removal
 - iv. Determine vibratory plow path for infected areas
- c. Conduct annual survey of hemlock post soil drench treatment
 - i. Check the tagged hemlock health
 - ii. Check for effectiveness of the first application of imidacloprid
 - iii. Check for new infestations and determine when the next application should be administered
- d. Manage the bidding process for contracting tree service crews and supervision of operations
- e. Direction for selection of species and planting for mitigating erosion is charged at an hourly rate of \$100/hour

2. ARBORIST TREE SERVICE CREW

- a. Felling, removal, and trenching around Oak Wilt infected areas of infected and susceptible beech trees
- b. Cutting, spraying, and removal of invasive plant species

3. LANDSCAPE + EXCAVATION CREW [POTENTIALLY GH PARKS CREW]

- a. Install water bars, boardwalks, or gravel on trails
- b. Plant native trees and plants to further stabilize the soil