

**City of Kalamazoo
TREE COMMITTEE
Minutes
September 6, 2022**

Water Reclamation/Wastewater Treatment Facility
1415 N. Harrison, Kalamazoo, MI 49007
Conference Room: WREC A

Members

Present: Erik Injerd, Forester, Consumers Energy
Anthony Ladd, Public Works Division Manager, COK
Patrick McVerry, Deputy Director - Parks & Recreation, COK
Steve Skalski, Water Superintendent & Asst. City Engineer, COK
Gail Walter, Environmental Concerns Committee (ECC)
Brian LaBelle, Forestry Supervisor, COK

Absent: None

City Staff: Karen Rutherford, Recording Secretary

Guests: Michael Smoter, Abonmarche
Jean Talanda, COK

A. CALL TO ORDER

Committee Chair Ladd called the Tree Committee Meeting to order on September 6, 2022, at 2:01 p.m.

B. ROLL CALL

Committee Chair Ladd completed roll call and determined the aforementioned members were present.

C. INTRODUCTION OF GUESTS

Committee Chair Ladd introduced the following guests: Michael Smoter with Abonmarche and Jean Talanda with the City of Kalamazoo.

D. APPROVAL OF AGENDA (September 6, 2022)

Committee Member LaBelle, supported by Committee Member Skalski, moved approval of September 6, 2022, Tree Committee Agenda. With a voice vote, the motion carried unanimously.

E. APPROVAL OF MINUTES (August 2, 2022)

Committee Member Injerd stated under New Business Item, a. 114, 118, 120 Burr Oak – Tree Removals, KNHS, in paragraph 4, it states Consumers Energy does not trim trees when they are on primary. He stated Consumers Energy does trim trees on the primary as their standard maintenance.

Committee Member Skalski supported by Committee Member LaBelle, moved approval of August 2, 2022, Tree Committee Minutes, as amended. With a voice vote, the motion carried unanimously.

F. NEW BUSINESS

a. Ransom Street – Tree Removals - Abonmarche

Committee Chair Ladd opened discussion for the tree removals on Ransom Street. He stated Abonmarche is working on behalf of the City to put together plans for the Ransom Street Project.

Mr. Michael Smoter, with Abonmarche, stated the construction will start in 2023 at the easterly project limits near the intersection of Walbridge and Ransom, and continue through the intersection of Burdick and Ransom in the first year. Construction from Burdick to Westnedge will take place in Phase 2, during the 2024 construction season. This will have a major impact on the street. The City is going to improve the streetscape in accordance with their objectives with the Northside Cultural Business District. He noted this will be a total right of way reconstruction of all pavement including sidewalks, curbs, and roadway. The storm and water main will be replaced. All trees in the corridor will be impacted. He presented a site plan indicating the number of trees to be impacted. Not all the trees will be in direct conflict with the roadway or utilities of the project but there will be trees that will be severely at risk due to the impact to the critical root zones from excavation and construction in the area. He stated they do not have a final landscape plan. They are working through that with Community Planning and the stakeholders in the neighborhood. He is asking for feedback from the Tree Committee to see if this is feasible and if there are any special requirements.

Mr. Smoter stated there are 40 trees scheduled to be removed and they are all in the City right of way.

Committee Member LaBelle stated the 40 trees are a mix of species. The majority of the trees are small crabapples.

Mr. Smoter presented a list of impacted trees which included the reason for the requested removal. Discussion ensued.

Committee Chair Ladd stated we commonly ask for two for one replacement. This is not possible for this immediate area. We can plant in other areas in the City. It is difficult to determine what replacement would be at this time. It will be decided on the final landscape design.

Committee Chair Ladd stated this is new business district. We are trying to provide what the community desires to be placed in this area. At this time, it is difficult to say where trees will fit into the landscape. Discussion ensued.

Mr. Smoter stated if the City has key species they are wanting to preserve, get him a list and they will look to see how that plays in the streetscape and will try to preserve them. He stated they would have a set plan by mid-October. This date depends on what the Tree Committee is looking for. Committee Chair Ladd stated they would provide a list.

Committee Member Skalski stated they would like to know the final planting plan, species, size,

etc. prior to approval.

Mr. Smoter asked with regards to removal, is right of way permitting done by the City or does that fall under the contractor. With seasonal cutting limitation that affect bats, sometimes that falls outside of the contract window. Is there a preference? Committee Chair Ladd stated we would prefer that to be done by the contractor. If the start date for construction falls outside that window, it might be beneficial to word the contract to remove the trees prior to the cut-off date. The removal of tree deadline for the Indiana Bat ends October 15th to March 8th. The trees would need to be taken down before October 15th.

Committee Member Skalski, supported by Committee Member LaBelle, made a motion to table a decision for a couple of months. The Tree Committee will provide a list of trees for preservation to Abonmarche. Once landscape plan is final, Abonmarche will come back to the Tree Committee for a final decision. With a voice vote, the motion carried unanimously.

b. **Forestry Stewardship Plan – COK – Jean Talanda and Brian LaBelle**

Committee Chair Ladd opened discussion for the Forestry Stewardship Plan.

Jean Talanda stated she is working with the Water Resources Division, and it is her job to manage the well fields in terms of land use. Our well fields are where we get our groundwater extracted out of the ground. We try to control the land use and chemical use around these areas to reduce negative affects to our drinking water supply. We have several tracts of land, Al Sabo, Campbell Lake, and Ross Township. We allow access to these areas, and it is a challenge to control people's use. We allow farming on some of these properties, and we strictly reduce the chemical use so they are as close to organic farming as possible. We neglected the health of the forest. Plants are great for water quality and infiltration. We just did a large 2-year study on one of our well fields, approximately 30% of the surface water body at that well field is pulled into our drinking water supply. Keeping these lands in good shape is her objective. As pilot study, they chose Ross Township because it is in an area that doesn't affect many people, it's not in the City, and it is a future well field. They have a number of test wells to measure the ground water area. We want it to keep it pristine. Gull Creek runs into it which is a high-quality stream. The groundwater infiltrates the streams. She noted this management plan has a lot of benefits that would help us in the long run produce funding to reduce some of the invasive species, ensure better land management, have healthier trees stands, better underbrush, and the benefits of the underlying aquifers.

Committee Member LaBelle stated with the Forestry Stewardship Plan we would be joining the DNR's program and be part of their new program called Forest to Facets. This is a big deal; we are the first to do this. This is a pilot plan that we will be part of to help manage the forest for actual water quality. This will help the forest and aquifers below the surface.

Ms. Talanda stated this is a long-term project. It provides funding to take care of the property. If it is successful, it will be beneficial to do the same for others tracks of land.

Committee Chair Ladd asked how long before we see the benefits of the project? Ms. Talanda responded she could not say for sure. It's needs to be accepted by the community. As it is, we cannot use the roads we built to find the wells. There is no money currently. This will help fund us to get to the wells. The land value will increase if we have a healthy forest.

Ms. Talanda suggested that we harvest some of the trees in these areas to get started. It is a very

specific plan. There is a strategy to the process for removing the trees in each area. There are five areas, and the plan has a specific strategy for each area.

Committee Member Skalski stated knowing the history of trees that have fallen near the well fields near residential areas, being pro-active and removing some of these hazardous trees would be beneficial.

Committee Member Skalski, supported by Committee Member LaBelle, made a motion to proceed with the Forest Stewardship Plan and approved the removal of these trees. With a voice vote, the motion carried unanimously.

Committee Chair Ladd stated it would be interesting to hear back on how the plan is proceeding and what improvements are being seen. Ms. Talanda stated it would be extremely valuable to have this done at Al Sabo.

G. OLD BUSINESS

Committee Chair Ladd stated there is no Old Business for today.

H. ACTION ITEMS

Committee Chair Ladd stated there is an attached update for the listed Action Items that Brian LaBelle has provided.

- a. Action Item from 9/1/20 - 448 Burdick St - Gospel Mission
 - i. Brian Labelle reports: Sent email to Clay Stull with AVB on 7/15/22, with no response.
- b. Action Item from 10/6/20 - Blakeslee Tank – COK
 - i. Brian LaBelle reports: The tree has not been removed and the trees have not been planted.
- c. Action Item from 10/28/20 - MDOT I-94 Project
 - i. Brian LaBelle reports: I will follow-up on this project.
- d. Action Item from 4/6/21 - Haymarket Plaza - Tree Removal – Treystar
 - i. Brian LaBelle reports: Trees have been removed. Planting of four trees needs to be done.
- e. Action Item from 4/6/21 - Parkview Avenue Project - Tree Removals – COK
 - i. Brian LaBelle reports: Project started this year. Tree has not been removed.
- f. Action Item from 5/4/21 - New Edison School on Lake and Russell (entire block) – TowerPinkster
 - i. Brian LaBelle reports: Trees have not been removed. He will follow up.
- g. Action Item from 6/1/21 – 1151 Royce Ave – Joshua Sortland
 - i. Brian LaBelle reports: Sent email to Joshua Sortland on 7/15/22, with no response

I. PUBLIC COMMENT

None.

J. COMMITTEE COMMENTS

Committee Chair Ladd stated there is a meeting this Thursday to discuss and understand what direction we want to take with the City Tree Ordinance. This meeting will be Davey Resource Group. The plan is to create a second document that will outline City policies and regulations for trees in the City right of way. Our hope is to pursue a DNR grant to help fund this. He would like to see involvement from the members of the Tree Committee. The meeting is scheduled for Thursday, September 8th at 4:30.

K. ADJOURNMENT

Committee Member Skalski made a motion to adjourn the Tree Committee meeting, supported by Committee Member LaBelle. With a voice vote, the motion carried unanimously. The meeting was adjourned at 2:56 P.M.

Submitted by: *Karen Ruthford*
Recording Secretary

Date: 10-4-2022

Approved by: *ACE*
Staff Liaison

Date: 10/7/22

Forest Stewardship Plan



Prepared for the City of Kalamazoo
Environmental Programs & Water Resources Division

Plan Prepared by Mark P. Janke
Mark P. Janke, Consulting Forester, LLC, Registered Forester #545

Plan Duration: 10 years (2023-2033)



The Forest Stewardship Program is funded by the United States Forest Service
and administered by the Michigan Department of Natural Resources.

www.Michigan.gov/ForestStewardship

Landowner Contact Information		Plan Writer Contact Information	
Name: City of Kalamazoo-Environmental Programs & Water Resources Division Ross Township Parcel		Name: Mark Janke (President) Mark P. Janke, Consulting Forester, LLC	
Address: 241 W South Street, Kalamazoo, MI 49007		Address: 2676 111 th Ave., Allegan, MI 49010	
Phone: (269) 337-8583		Phone: (269)-673-7367	
Email: talandaj@kalamazoocity.org		Email: mark@michiganforester.com	
Property Information			
Total Acres: 224	Forested Acres: 224	Acres in Plan: 224	Tax ID: See list below
Town: 1S	Range: 9W	Township: Ross	County: Kalamazoo
Property Legal Description (Quarter Section, Section, Town, Range, Township, County: 224 acres in the SW1/4 Section 30 and the NW1/4, Section 31, Ross Township, Kalamazoo County, Michigan. PARCEL(S) 04-30-326-010, 04-30-326-021, 04-30-385-011			
Landowner's Goals for this Forest Stewardship Plan			
<ol style="list-style-type: none"> 1) Actively manage the forest for recreation, aesthetics, forest health, sustainable timber production, soil resources, and education. 2) Prepare for sustainable commercial timber harvest in the future. 3) Protect forest from pests and diseases and protect threatened and endangered species. 4) Protect water quality and wetlands areas. 5) Enhance educational opportunities for Natural Resources at the institution. 			
Michigan's Stewardship Ethic			
Stewardship is an ethic recognizing that the land and its natural inhabitants have an inherent worth and that we have a responsibility to consider the land as we protect, manage, utilize, and enjoy the forest. Stewardship guides us to conduct our activities to the utmost of our abilities, to ensure the future health, productivity, diversity, and well-being of the land, its natural communities, and species, and to provide opportunities to our successors that are at least equal to ours to use and enjoy the land and its resources.			
Signatures of Approval from Landowner, Plan Writer, and DNR Service Forester			
This plan describes my goals and objectives for my forest. Participation in the Forest Stewardship Program is voluntary and only indicates my intent to practice sustainable forest management. I understand that enrolling forestland into separate property tax programs like the Commercial Forest Program or the Qualified Forest Program requires my compliance with an approved forest management plan in exchange for the reduction in property taxes.			
Landowner:		Date:	
Plan Writer: Mark P Janke, CF, ACF		Date: 7-13-2022	
DNR Service Forester:		Date:	

After review and approval by the Landowner, the Plan Writer will submit the entire Plan to the nearest DNR Service Forester for their review. **Electronic submission of the Plan is encouraged by emailing a Word document or pdf file to the Service Forester.** The DNR Service Forester will return a hard copy or pdf of the final signature page to the Plan Writer after approval.

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Introduction

Forest Stewardship Program

The purpose of the Forest Stewardship Program is to encourage nonindustrial private forest landowners to actively manage their forest to accomplish their own personal goals for their land. The voluntary Program provides landowners with professional planning from private sector foresters and wildlife biologists to develop and implement their Forest Stewardship Plan. The United States Forest Service (USFS) started the Forest Stewardship Program in 1991 because only 5% of family forest owners had a written plan to guide their forest management activities. The USFS supplies funding and partners with each state forester to provide professional planning and technical assistance to private landowners in their state. The Department of Natural Resources (DNR) administers the Forest Stewardship Program in Michigan. About 5,000 landowners in Michigan have developed a Forest Stewardship Plan to help them protect, manage, and enjoy their unique forest. See www.michigan.gov/foreststewardship for more info.

Landowner's Goals

The City of Kalamazoo owns several properties that have important water producing wells that they manage for the people of Kalamazoo. This property is referred to as the "Ross Township Property" and is a 224-acre property of primarily forest and wetlands. The property is not currently developed, has only a small strip of agricultural land and has not had any prior forest management activity that is apparent. The City's primary goals are to protect the property for potential water well development and general environmental stewardship so that a constant supply of high-quality water is available for the residents of Kalamazoo and that they are good stewards of the lands entrusted to their care. It was suggested by one of the neighbors of the Ross Township Property that active forest management would likely be compatible with the City's goals for the property as healthy forests help protect water quality while at the same time, they can produce other important outcomes such as timber, improved wildlife habitat and recreational values. In most cases, the goals for the landowner reflect their preferences, the attributes of the forest, and the desired future conditions for the land. The primary goal is to manage for long term sustainability and forest health by demonstrating active stewardship and sound management for the multiple uses of timber, wildlife, water quality, and recreation. The landowners have identified the following goals with their forester:

1. Sustainable production of high-quality water for the City of Kalamazoo.
2. Sustainable production of high-quality timber and the production of an economic return from periodic harvest activity that is consistent with maintaining high water quality and improved forest health.
3. Maintain high quality wildlife habitat through active management.
4. Protect soil and water resources.
5. Address forest health concerns such as invasive species.
6. Protect the land from non-authorized use or degradation of the resource by trespassers.
7. Create a legacy for the residence of the City Kalamazoo and Kalamazoo County to enjoy.

In many circumstances, various management strategies can be designed to achieve multiple long-term goals that can enhance the benefits that landowners find desirable from the property. By conducting appropriate forest management practices now, such as the prescribed timber harvests, it

will help future generations of the land to be part of the legacy. Wise sustainable forest management not only considers present forest condition, but also applies scientific principles of forestry management to insure sustained health and increased productivity of the forest over the long term.

General Property Description

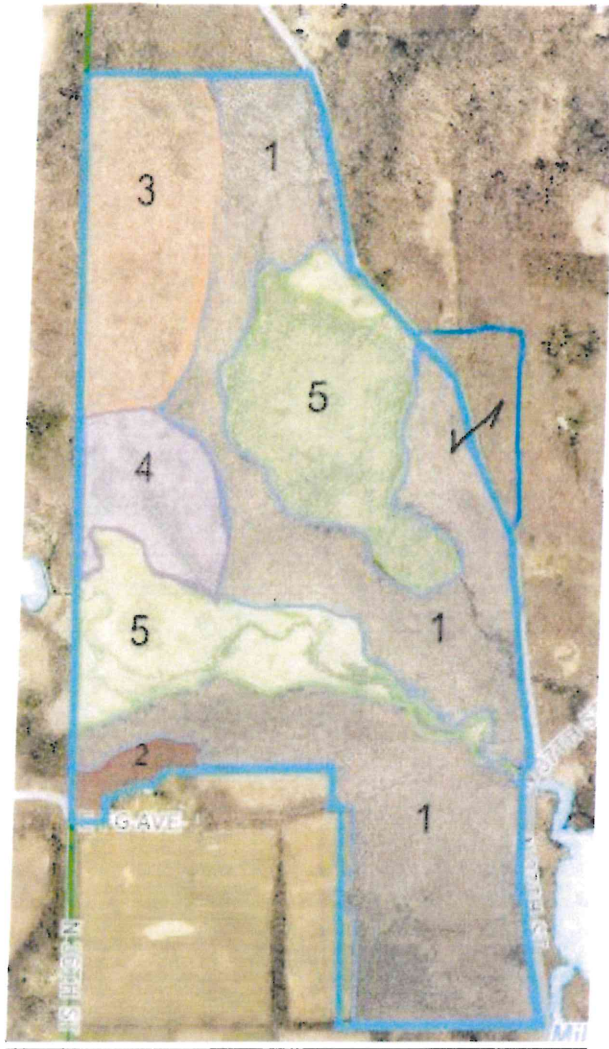
The Ross Township Property is situated in eastern Kalamazoo County between Richland and Augusta, Michigan. The land is just south of M-89 and is bordered by Greer Road as the eastern boundary and the southwest corner of the property is accessible from 36th Street. The property is undeveloped land that is comprised of primarily Mixed Deciduous Forest along with an important wetland complex, connecting natural drainage in the Three Lakes and Mill Pond area. This property is only a few miles south of Gull Lake. Gull Lake has reportedly some of the highest water quality of any lake in the entire State of Michigan. Throughout this plan, we have divided the property into 5 separate management units or “stands”. A stand is a forestry term for an area of land containing a similar cohort of trees according to species, age class, site conditions, or management practices.

Ownership Map

Figure 1. Map of the City of Kalamazoo- General property map overview:



Figure 2. Map of the management units/ stands on the property:



Stand	Acres	Activity
Stand 1: Mixed Deciduous (MD)	121	2023: Commercial Timber Harvest 2033: Commercial Timber Harvest
Stand 2: Black Walnut (BW)	4	2023: Commercial Timber Harvest 2033: Commercial Timber Harvest
Stand 3: Upland Mixed (UM)	29	2023: Commercial Timber Harvest 2033: Commercial Timber Harvest
Stand 4: White pine/Upland Mixed	14	2023 Commercial Timber Harvest
Stand 5 Wetlands	56	Protection
TOTAL	224	

Table 1- STAND TABLE

Terrain map

Figure 3. Map of the terrain on site.



Resource Descriptions

Resources Common to the Entire Property

The following natural resource elements are applicable to the entire property. Additional resources will be described in more detail for each stand.

Threatened and Endangered Species. The Michigan Natural Features Inventory (MNFI) and The Department of Natural Resources (DNR) reports that there are threatened, or endangered species present in the area.

- Speyeria Idalia, Regal fritillary, last observed 1963, Endangered (Legally protected)
- Acris blanchardi, Blanchards cricket frog, Threatened (Legally protected)
- Lithobates palustris, Pickerel frog, last observed 2005, Special Concern (Rare or Status uncertain: not legally protected)
- Scutellaria elliptica, Hairy skullcap, last observed 1947, Special Concern; not legally protected)

Archeological, Cultural, and Historic Sites. There are NO KNOWN special sites or Archeological sites located on the property. The State Historic Preservation Office database does NOT indicate the presence of historical sites in this section of the Township (www.Michigan.gov/Archaeology). Standard Seven of the American Tree Farm System is Protect Special Sites- “Special sites are managed in ways that recognize their unique historical, archeological, cultural, geological, biological, or ecological characteristics”. Special sites also include unique natural communities, but there are no unique natural communities on this property (mnfi.anr.msu.edu/communities).

Forests of Recognized Importance. This property is not located within a “Forest of Recognized Importance” (FORI), which in Michigan are forests along the Great Lakes coastline, forests along Natural or Wild and Scenic Rivers, rare forest types (old growth), or forests that provide important wildlife habitat (>500 contiguous acres in the southern Lower Peninsula are required habitat for threatened or endangered species statewide). Landowners within a FORI should manage their forest to protect the ecological integrity of that larger important ecosystem.

Management Access. Access to the property for forest management activities will be from Greer Drive and North 37th St to the east or from the corner of 36th and East FG Avenue at the southwest corner of the property.

Wildlife. This diverse property provides especially important wildlife habitat for many species. The diversity provides stable food sources, shelter and nesting habitat, foraging areas, thermal cover, and nesting areas. Forest management activities will improve the wildlife habitat by creating brush piles, leaving cavity trees, and creating a mosaic of conditions across the landscape. Continuing forest management in the future will lead to a more productive forest and better quantity of wildlife species. The list below provides highlights of some of the key species that are present on the property. This list does not include every species as many more are likely present.

Bird Species:

American Robin
House Finch

Northern Cardinal
American Goldfinch

Common Grackle
Baltimore Oriole

Scarlet tanager	White Breasted Nut Hatch	Northern Flicker
Ovenbird	Northern Flicker	Black Capped Chickadee
Wild Turkey	Veery	Bald Eagle
Great Horned Owl	Pileated Woodpecker	Red Bellied Woodpecker
Downy Woodpecker	Scarlet Tanager	Crow

Mammals:

Raccoon	Opossum	Woodchuck
Squirrel	Rabbit	Coyote
Fox	White-tail deer	

Reptiles:

Eastern Gartner Snake	Painted Turtle	Green Frog
Butler's Gartner Snake	Bull Frog	Western Chorus Frog
Northern Ribbon Snake	Eastern American Toad	Eastern Massasauga Snake

Insects:

Honeybees	Butterflies	Multicolored Asian Lady Beetle
Wasps	Ants	Spiders

General Process of Commercial Timber sales

Timber Sale Process: Consulting foresters play a critical role in all areas of forest management. Forest management often involves the harvest of timber to accomplish silvicultural goals. Foresters help by streamlining the entire process including the selection of proper trees based on science, experience, and the stated landowner goals and objectives. In addition, timber sales set up by professional consulting foresters make sure poor-quality trees are included in the timber sale offering along with some better trees. Prices paid for timber sales offered to the marketplace by consulting foresters often yield higher returns than timber sold by a landowner directly to a timber buyer. There are five basic steps in the timber sale process. The timber sale process can take six to eighteen months, so start planning a year before the desired time of harvest. Spring is often a good time to start preparing for a fall or winter harvest.

Step One: A forest inventory measures the attributes of the forest to determine how to proceed with the sale. This Forest Stewardship Plan does not include this inventory, but the visual stand assessment helps determine when stands are ready for a harvest.

Step Two: The inventory data is used to decide which trees to sell by applying silvicultural methods appropriate for that forest type in accordance with the landowner's goals. The forester should determine which trees to sell, paint those trees at stump and breast height, measure approximate volume, and determine approximate current market value. It is important that the landowner knows the location of their property corners and property lines so that all trees included in the sale are within their property lines. If necessary, a professional boundary survey that locates property corners and marks a few points along property lines is a particularly good investment. This practice minimizes any conflict with neighbors and avoids unintended timber trespass. Surveyors are expensive, but they are a lot cheaper than lawyers.

Step Three: The forester should advertise your timber sale. The true market value of the trees marked for sale is determined by marketing a prospectus to multiple buyers. The forester would write a prospectus describing the trees for sale and will send it to reputable timber buyers to invite them to inspect the trees for sale prior to bidding.

Step Four: The fourth step is to negotiate a timber sale contract between the landowner and the timber buyer. You and your consulting forester should select the best buyer together based on price and other factors (reputation, timing of the harvest, equipment to be used, etc.), check references of the winning bidder, write a unique contract, collect a performance bond, verify liability and workman's compensation insurance. Full payment is collected for the landowner PRIOR to harvest for a lump sum sale of standing timber. The contract period should include two or even three winters to allow loggers enough time to perform the harvest in suitable conditions. The contract will specify that the harvest is to occur when soil conditions are suitable to minimize potential impacts.

Step Five: The forester should also supervise the timber harvest to ensure the contract is followed. Together with the forester, you and the buyer can determine the best location for skid trails and log landings to accommodate log trucks and harvesting equipment. Consider placing the landing area and skid trails in areas that can be used to service future timber harvests or provide better access for recreational pursuits. Your forester should make visits to the harvesting site during timber harvest to verify performance and help answer questions that the logger may have that arise during the logging. At the end of the harvest the forester will refund the performance bond back to the purchaser after all the conditions of the timber sale contract have been successfully met.

Timber Harvest Methods: Foresters use two categories of timber harvest methods; even-aged and uneven-aged methods. Even-aged methods create a whole new cohort of trees with a similar age throughout the entire stand while uneven-aged methods preserve a large variation in age classes in the stand. Even-aged harvest methods include "shelter-wood" and "clear-cuts" – both of which favor the regeneration of shade intolerant species, such as Aspen, Oak, Cherry or Black walnut that require lots of sunlight for reproduction and survival. Even-aged methods are also used in plantation forestry. Uneven-aged harvest methods include "single tree selection" or "group selection" – both of which favor the regeneration of shade tolerant species like Sugar maple and American beech that can reproduce and survive under full shade. Uneven-aged silvicultural methods will be used on the majority of the units to maintain the diverse age classes and species composition of the forest.

Figure 4: Demonstrates the differences between an even-aged and uneven-aged forest.

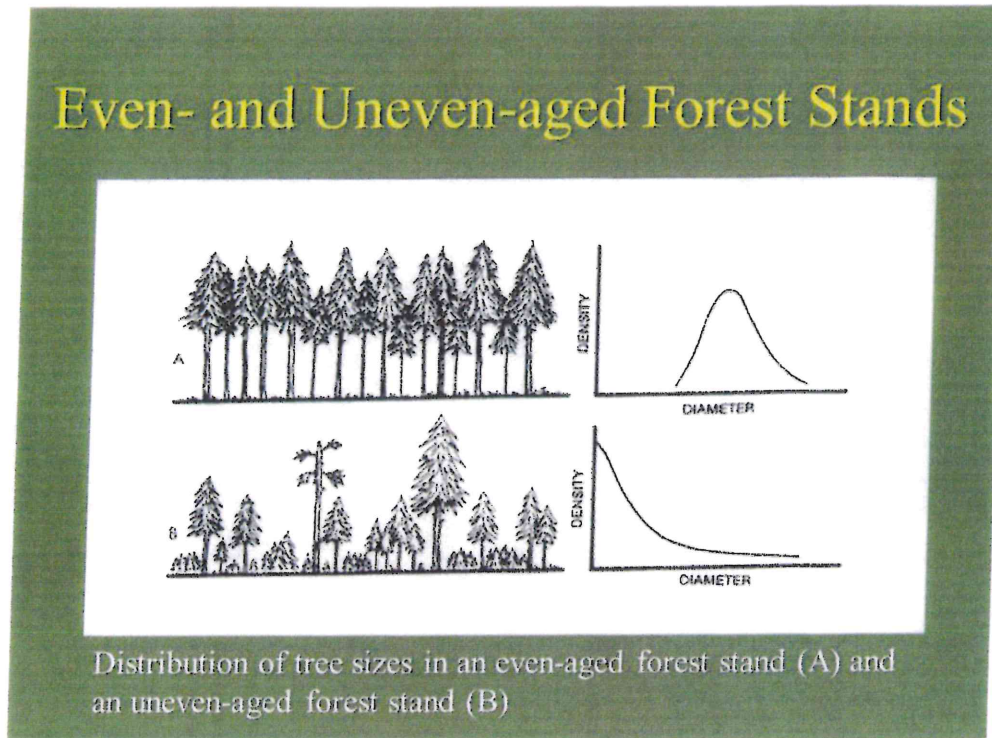


Figure 5: Diagram demonstrating single tree selection.

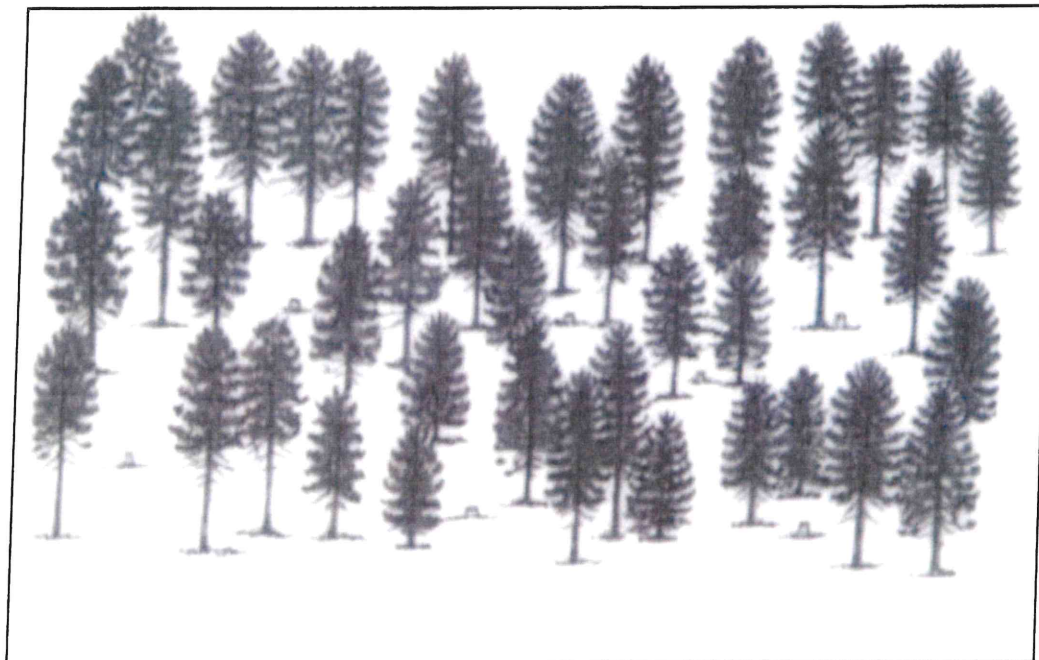
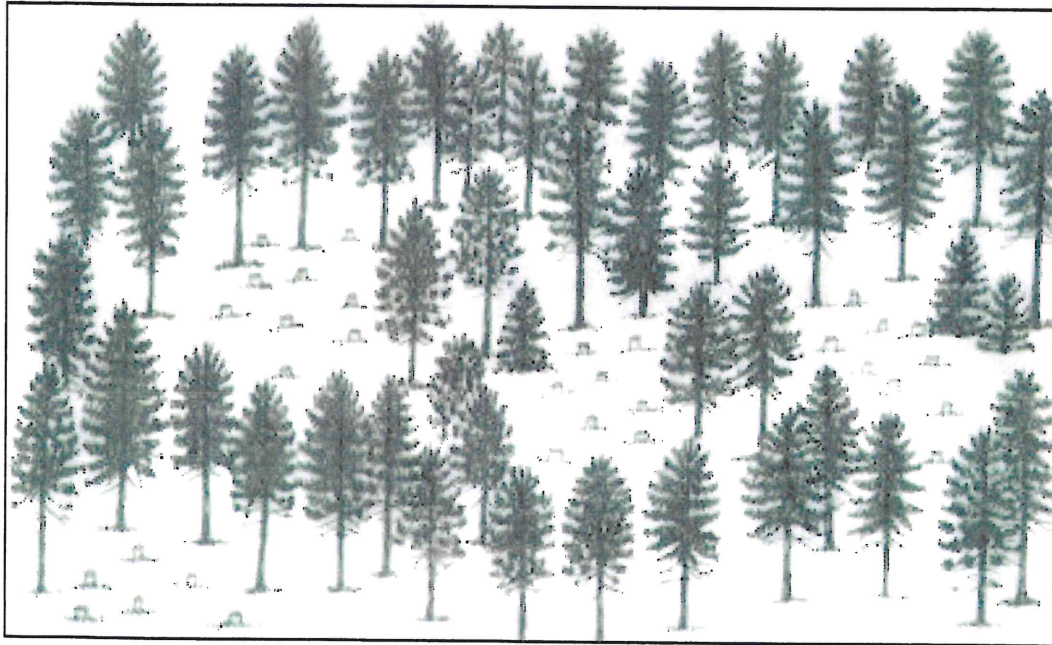


Figure 6: Diagram demonstrating group selection.



Wetlands

According to the National Wetlands Inventory Map Viewer (www.fws.gov/wetlands/data/mapper) there are wetlands present on the property. There are both freshwater emergent wetlands as well as forested wetlands, freshwater ponds, and a riverine included in this parcel.

A permit is not required for typical forest management activities, but a permit is required for filling, dredging, draining, or development. See (www.michigan.gov/deqwetlands) for more information. Any forest management activity near these wetlands should closely follow the “Sustainable Soil and Water Quality Practices on Forest Land” (Best Management Practices www.michigan.gov/dnr).

Wetlands Map: Figure 7:
(www.fws.gov/wetlands/data/mapper)

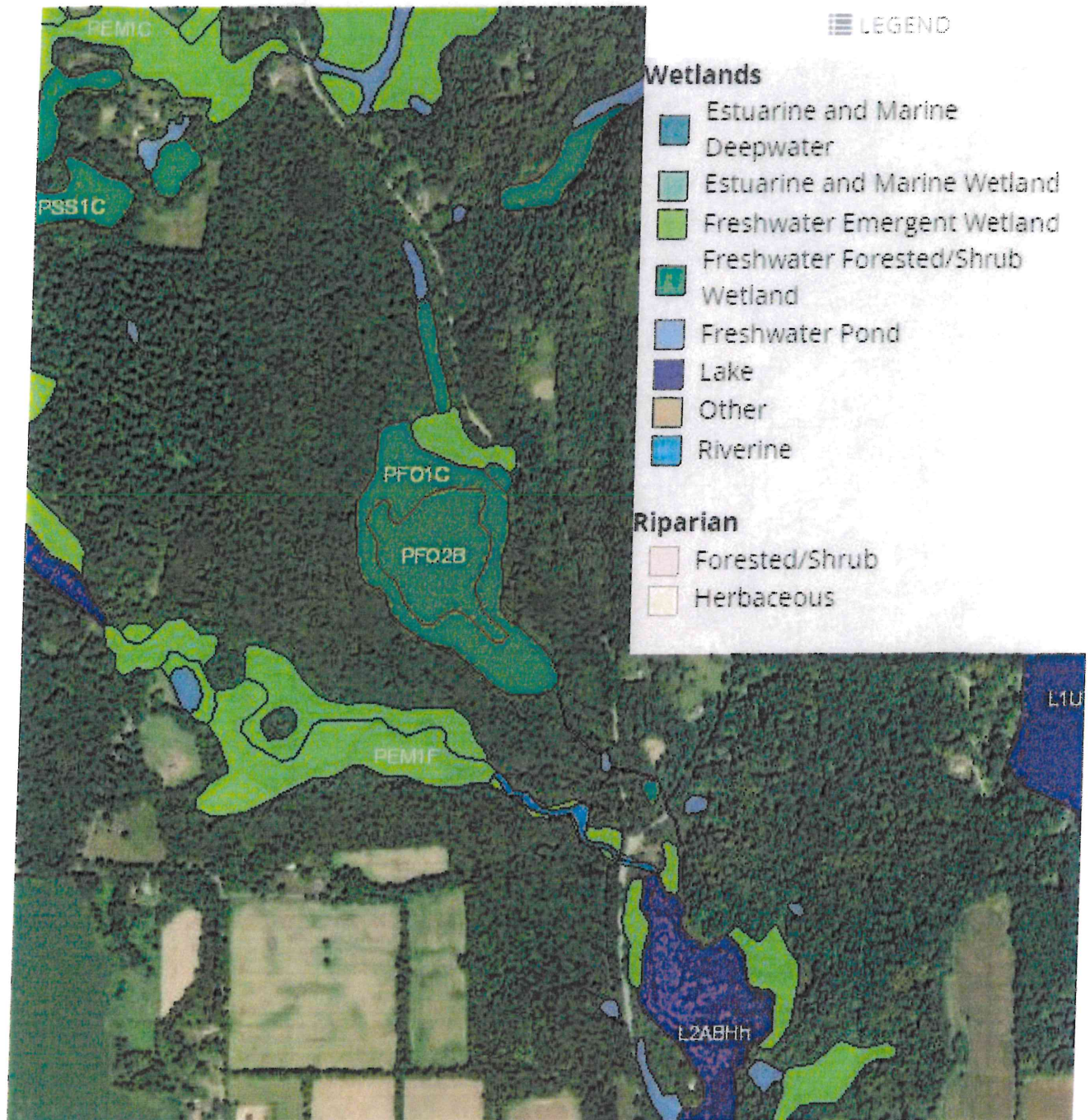


Figure 8: Kalamazoo County website – wetlands designation map:



*Green areas indicate wetlands

Riparian Management Zone

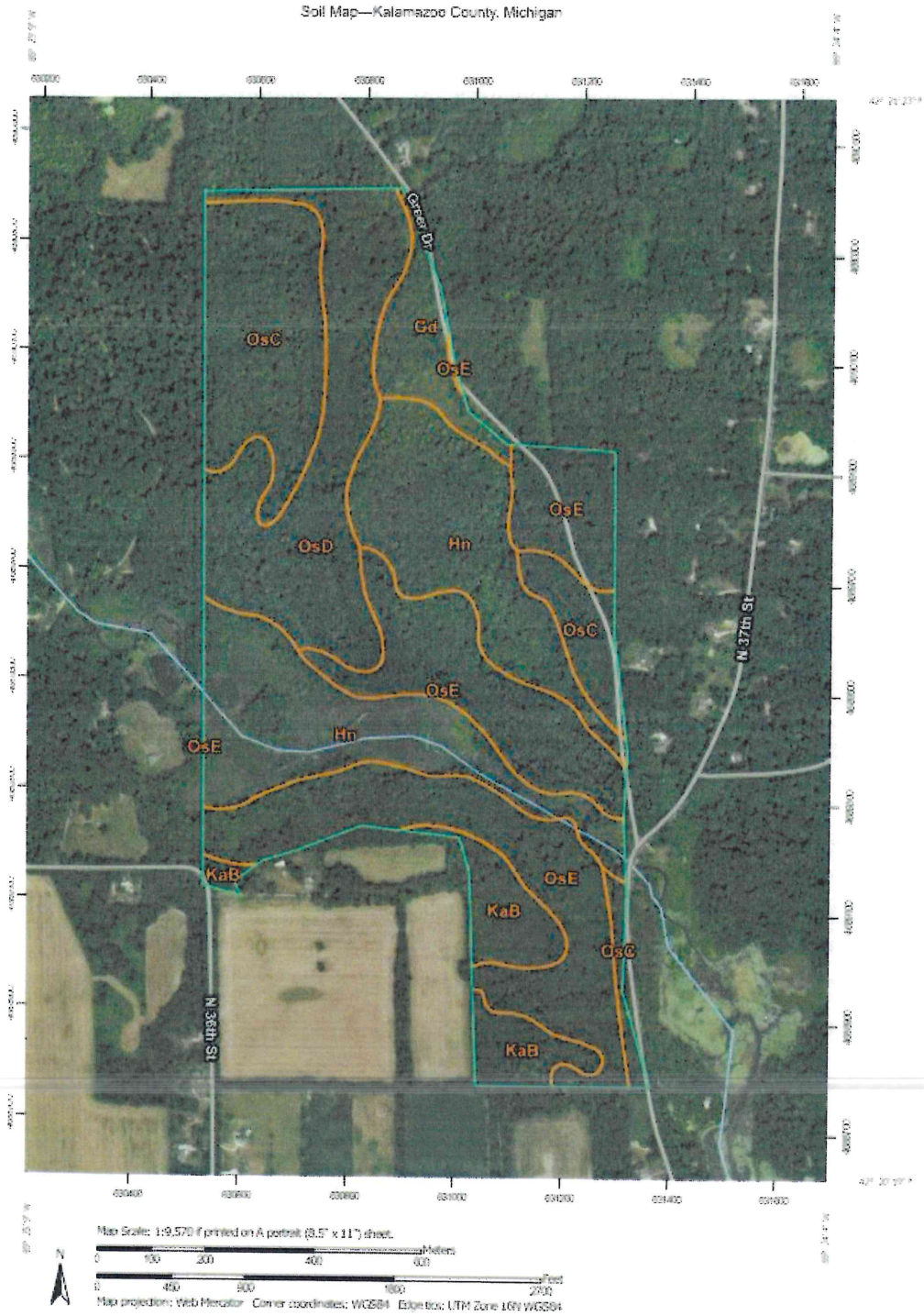
Riparian management zone (RMZ) is an important consideration for this ownership and should always be adhered to when conducting forest management activities. This property has a natural drain way (Gull Creek) which connects some very important lakes in Richland and Ross Township and water quality is the number one objective for the City on this ownership. Generally, a 50'-100' buffer zone of untreated or lightly treated vegetation should be maintained on both sides of the natural drainage and important wetland areas. The RMZ helps protect water quality by helping to minimize erosion and run off from heavy rain events. The RMZ is generally narrower on flat terrain and is wider with steeper terrain.



Figure 9- Picture of woodland areas and the importance of Riparian zones to protect wetlands.

Soil Map

Figure 10: Soil map:



(Image Source: USDA Web Soil Survey at www.websoilsurvey.nrcs.usda.gov)

T
Table 2 (A). Legend for Forest Soil Types:

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Gd	Gilford sandy loam, 0 to 2 percent slopes, gravelly subsoil	9.4	4.2%
Hn	Houghton muck, 0 to 1 percent slopes	59.7	26.8%
KaB	Kalamazoo loam, 2 to 6 percent slopes	14.4	6.5%
OsC	Oshtemo sandy loam, 6 to 12 percent slopes	35.8	16.1%
OsD	Oshtemo sandy loam, 12 to 18 percent slopes	37.7	16.9%
OsE	Oshtemo sandy loam, 18 to 35 percent slopes	65.4	29.4%
Totals for Area of Interest		222.6	100.0%

Soil Series Description

NOTE: The various soil types on the property determine the vegetation, economic productivity, potential for wind throw, susceptibility to erosion, and suitability for heavy equipment in active forest management. All management activities should take caution to protect the soil from rutting or erosion into the creek or nearby lake. Utilize Best Management Practices described in the “Sustainable Soil and Water Quality Practices on Forest Land” to protect soil and water quality (www.michigan.gov/PrivateForestLand). The following soil information is adapted from the soil maps and reports on the USDA Web Soil Survey at (www.websoilsurvey.sc.egov.usda.gov)

Oshtemo Sandy Loam: The Oshtemo series consists of very deep, well drained soils formed in stratified loamy and sandy deposits on outwash plains, valley trains, moraines, and beach ridges. Slope ranges from 0 to 55 percent. Most areas are cultivated. Principal crops are small grains, soybeans, corn, and hay. The remainder is in forest or permanent pasture. Native vegetation is hardwood forest of oak, hickory, basswood, and sugar maple.

Houghton Muck: The Houghton series consists of very deep, very poorly drained soils formed in herbaceous organic materials more than 130 cm (51 inches) thick in depressions and drainageways on lake plains, outwash plains, ground moraines, end moraines, till plains, and floodplains. Slope ranges from 0 to 2 percent. This series consists of very little woody vegetation averaging less than 15 percent per control section

Gilford Sandy Loam: The Gilford series consists of very deep, poorly drained or very poorly

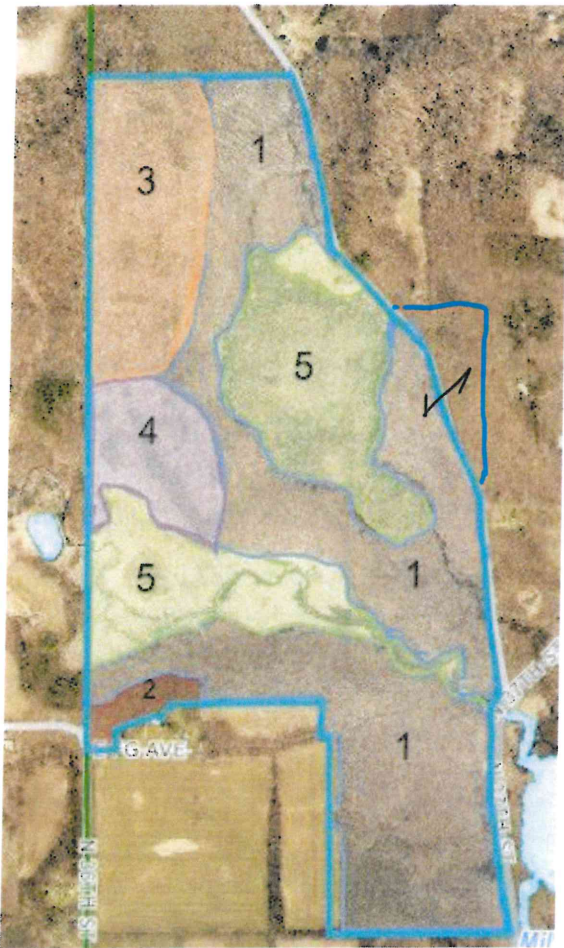
drained soils formed in loamy over sandy sediments on outwash plains, glacial drainage channels, near-shore zones (relict), and flood-plain steps. Slope ranges from 0 to 2 percent. Most of these soils are used for growing corn, soybeans, wheat, and oats. Native vegetation is dominantly herbaceous wetland in the western extent of the series and dominantly forested in the eastern extent.

Kalamazoo Loam: The Kalamazoo series consists of very deep, well drained soils formed in loess-influenced loamy outwash overlying sand, loamy sand, or sand and gravel outwash on outwash plains, terraces, valley trains, and low-lying moraines. Slope ranges from 0 to 18 percent. Saturated hydraulic conductivity is moderately low to moderately high in the loamy materials and high in the sandy materials. A large part is cropped to corn, wheat, soybeans, and hay. A small part is in pasture. Some areas adjacent to the larger cities are idle cropland. Native vegetation is forest consisting of Northern red oak, White oak, Black oak, Sugar maple, Black cherry, American basswood, Tulip tree, Red maple, Black walnut, Pignut hickory, and Shagbark hickory.

Table 2 (B): Forest Site Productivity by soil type- Site Index:

Tables – Forest Productivity (Tree Site Index): northern red oak (Schnur 1937 (820)) – Summary By Map Unit		
Summary by Map Unit – Kalamazoo County, Michigan (MI077)		
Map unit symbol	Map unit name	Rating (feet)
Gd	Gilford sandy loam, 0 to 2 percent slopes, gravelly subsoil	
Hn	Houghton muck, 0 to 1 percent slopes	
KaB	Kalamazoo loam, 2 to 6 percent slopes	
OsC	Oshtemo sandy loam, 6 to 12 percent slopes	
OsD	Oshtemo sandy loam, 12 to 18 percent slopes	72
OsE	Oshtemo sandy loam, 18 to 35 percent slopes	72
Totals for Area of Interest		

Stand 1- Mixed Deciduous (121 acres)



Narrative Description: Stand 1 is an uneven-aged Mixed Deciduous stand which occupies the largest stand in the Ross Township parcel at 121 total acres. Species present in this stand are Red oak, White oak, Black oak, Aspen, Black cherry, Black Gum Red maple, Black walnut, Hickory, Basswood and Sugar maple. The stand appears to be previously unmanaged and is a good quality Mixed deciduous stand with tree diameters between sapling size to 32” DBH.

Successional Trend: The successional trend of this stand is toward a greater presence of Sugar maple and Red maple over time as these species are shade tolerant. Hickory also can tolerate a good amount of shade and deer do not appear to browse the Hickory genus and it is a prolific seeder. Also, much of the Black cherry is mature and is declining in health, as is the Aspen. A great amount of Oriental bittersweet occupies most of the understory and is really beginning to take over and limit forest growth. There is a high volume of Sugar maple and Red maple in the understory. As they are more shade tolerant, they will begin to fill the gaps created by the deteriorating Black cherry and Black oak/Red oak. The site index for Red oak, the dominant species in much of this stand, is 72 indicating that the stand is a relatively high quality forest site.

Objective: Proper stewardship of this stand is for multiple values of timber, wildlife, recreation, aesthetics and water conservation.

Soil and Water: This stand is located on loamy sand which is well-drained and well suited for forestry activities. Slopes range from 6 to 35 percent. Some of this unit will need to serve as a filter strip between active forest management activities such as timber harvesting and the more fragile wetland areas that are adjacent to portions of this stand. Best Management Practices (BMP) guidelines should be adhered to when setting up any land management activity.

Timber: Stand 1 is primarily uneven-aged mixed deciduous stand with a diameter distribution of 0 to 36" DBH. The stand is presently in an overstocked condition which is limiting forest growth and overall forest health. Economics aside, a professionally marked and administered timber harvest will reduce the density back into the optimal range for improved forest growth and improved forest health.

Tree Size Class: 0-32" DBH with Oak sawtimber being dominant in the overstory.

Stand Density: The stand density (Basal Area) is 130 ft²/acre. 70-90 ft²/acre is optimum.

Forest Health: The overall health of this stand is very good. No Oak wilt was observed in this stand, but an abundance of invasive species was found throughout. Invasive species is the primary forest health concern on many Southwest Michigan forests and Oriental bittersweet seems to be the most pressing forest health issue to address along with Honeysuckle, Multiflora rose & Autumn olive.

Figure 11: Diameter Distribution of Stand 1 Timber:

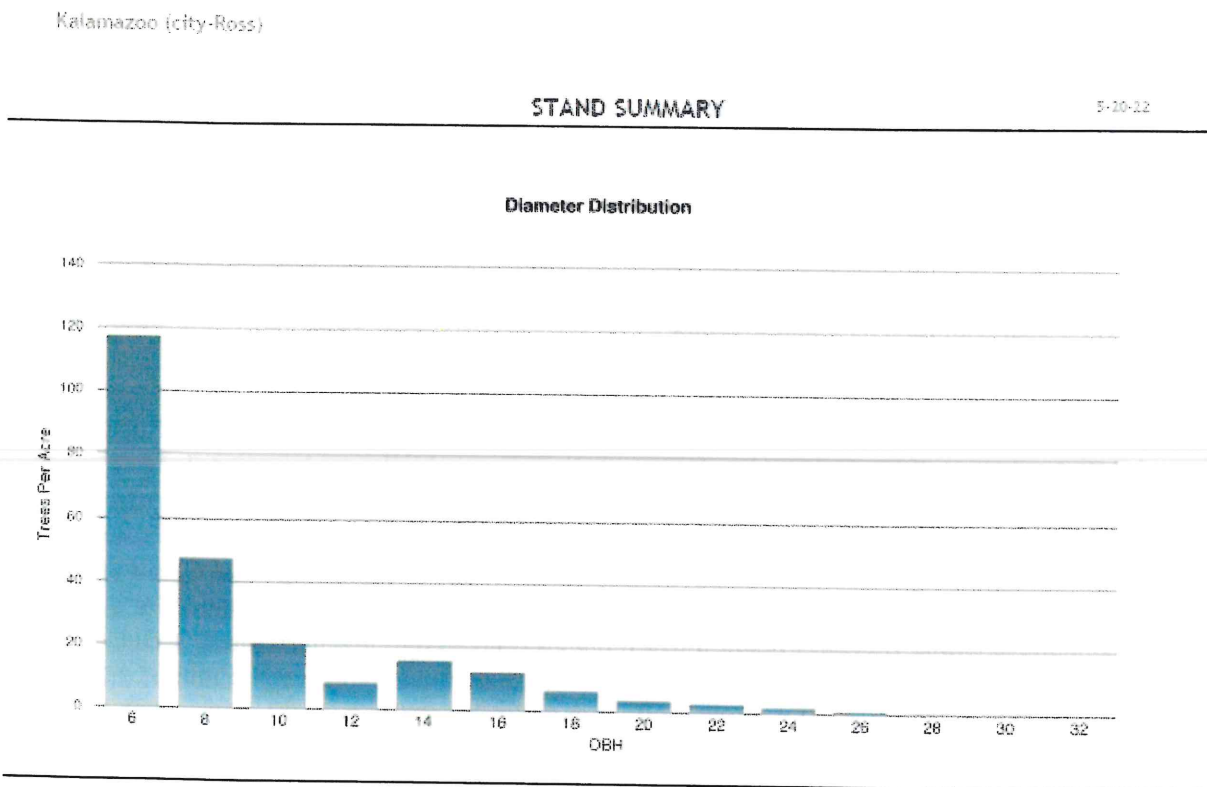
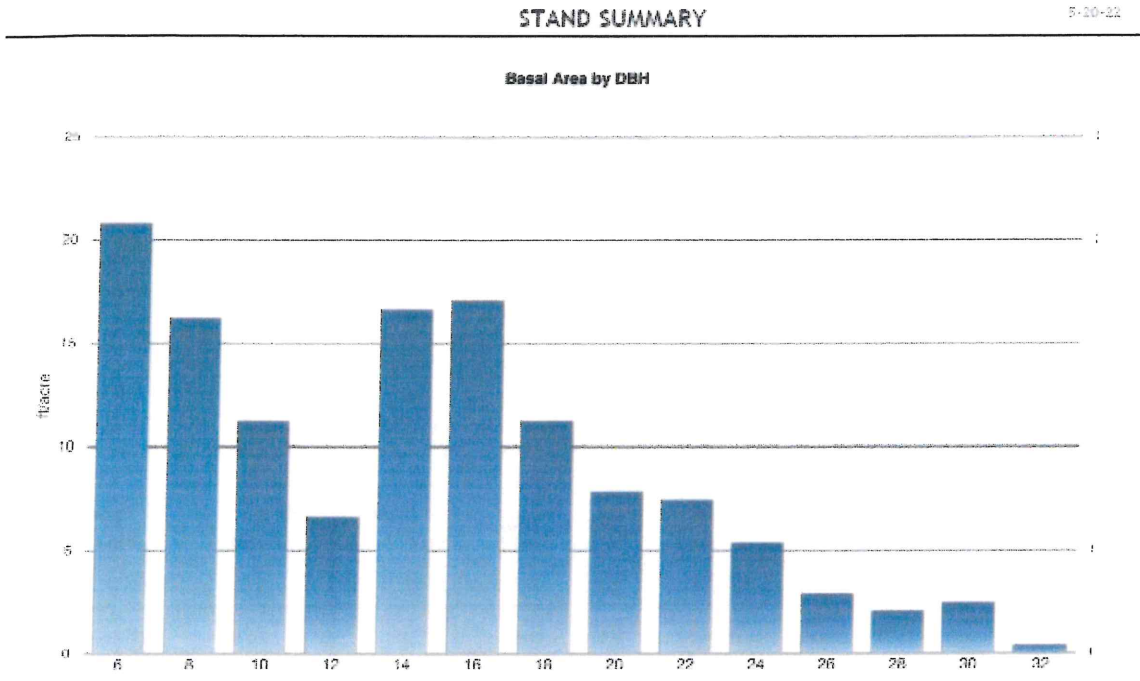
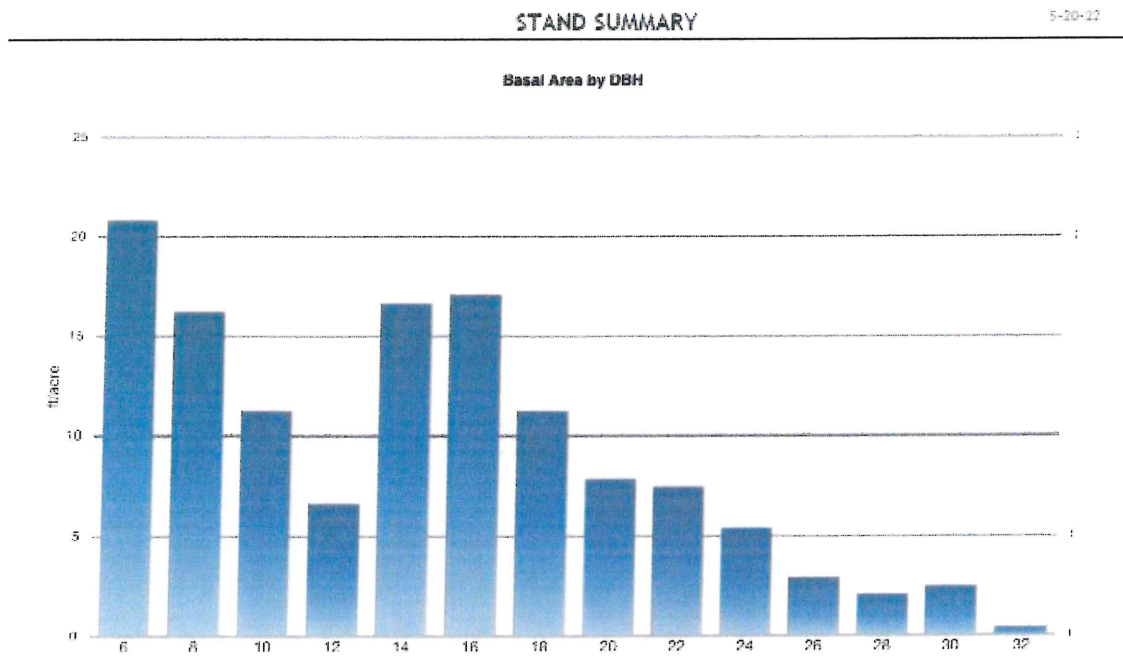


Figure 12: Summary of Stand 1 Basal Area:

Kalamazoo (city-Ross)



Kalamazoo (city-Ross)



Stand #1 Forest Inventory information:

Kalamazoo (city-Ross)

STAND SUMMARY

04/21/02

STAND #	Mixed Deciduous 9		BA 129.6	TPA 238.5						
ACRES	121.0									48 PTS
STATISTICAL ANALYSIS			VOLUME PER ACRE							
Confidence Interval	90%	BA	TPA	DBH	HGT	MBF	CORDS			
Average		129.6	238.5	10.0	47.0	9.55	19.19			
Sampling Error		7.1%	16.0%			17.7%	0.4%			
Probable Lower Limit		120.4	200.3			7.86	17.57			
Probable Upper Limit		138.7	276.8			11.25	20.81			
SPECIES COMPOSITION			TOTAL STAND VOLUME							
		BA	TPA	AVG DBH	AVG HGT	MBF	CORDS	MBF	CORDS	
		129.6	238.5	10.0	47.0	9.55	19.19	1,156.01	2,921.19	
red maple	32.5	25.1%	59.4	10.0	49.3	2.15	4.92	289.01	594.75	
black cherry	30.4	23.5%	70.0	8.9	43.1	1.30	4.67	161.33	564.76	
northern red oak	22.9	17.7%	23.9	13.3	63.6	2.78	3.00	336.38	363.10	
black oak	7.5	5.8%	9.2	12.0	55.1	0.78	0.92	94.76	111.78	
silver maple	5.4	4.2%	12.8	8.9	41.2	0.22	0.91	27.21	110.54	
pignut hickory	5.0	3.9%	5.6	12.8	60.0	0.46	0.69	55.25	84.09	
black walnut	5.0	3.9%	9.4	9.9	54.7	0.46	0.73	55.30	87.01	
white oak	4.6	3.5%	3.9	14.7	58.9	0.40	0.55	57.57	66.95	
bigtooth aspen	4.2	3.2%	4.1	13.6	68.0	0.39	0.59	47.62	71.35	
sugar maple	4.2	3.2%	14.6	7.2	35.2	0.06	0.84	6.81	101.62	
blackgum	2.1	1.6%	7.0	7.4	38.4	0.07	0.35	0.63	42.17	
American elm	1.7	1.3%	7.7	6.5	26.0		0.31		37.32	
bitternut hickory	0.8	0.6%	3.3	6.8	36.0		0.19		23.15	
cassafras	0.8	0.6%	1.1	12.0	40.0	0.02	0.16	3.23	19.17	
pin oak	0.8	0.6%	0.9	13.3	44.0	0.08	0.08	9.46	9.58	
white pine	0.4	0.3%	0.2	20.0	48.0	0.02	0.07	3.88	3.43	
northern pin oak	0.4	0.3%	0.2	22.0	50.0	0.07	0.06	0.36	6.66	
black locust	0.4	0.3%	3.1	5.0	40.8		0.10		11.76	
hackberry	0.4	0.3%	3.1	5.0	16.0		0.06		6.70	

Stand 1- Management Recommendations

Activity 1-1: Commercial Timber Harvest to reduce the stand density back into the optimum range of between 70-90 ft² per acre, removing a mix of mature, over-mature and declining trees to favor the healthiest trees for the long-term management of the forest.

Timber Harvest Objectives: The primary objective for any timber sale is to improve the forest, as defined according to the values of the landowner and the attributes of the forest. A timber sale should improve the species composition and growing conditions of remaining trees for future timber sales. One of the many benefits about managing a forest for sustainable timber production is that it is very compatible with other goals such as wildlife management, forest health, etc. In this stand and with proper forest management it is possible to conduct a timber harvest about every ten to fifteen years while keeping aesthetics, biodiversity, and wildlife habitat as equal priorities. As foresters, our priority is to keep quality trees in the forest and not just selling most of the quality trees (a practice called high grading). A timber sale can be used to improve wildlife habitat, develop trails for recreation, improve forest health, and regenerate new trees. In this instance we are wanting to focus management efforts on the growth of high-quality hardwood varieties such as Black walnut, Red oak, White oak, Sugar maple, Red maple and Hickory. Over time, shade tolerant species such as Red maple, Sugar maple and Hickory can overtake what was originally an oak dominated forest community. Forest management efforts should focus on creating openings or pockets in the canopy that will allow shade intolerant species such as Red and White oak to have an opportunity to regenerate, as Oaks are an important component of high-quality forest communities and have tremendous value to many species of wildlife. This will give less shade tolerant species such as Red oak, White oak and black cherry a better chance to regenerate.

Timber Sale Timing: We recommend this stand is harvested within the next year or two as the stand is overstocked, growth rates have declined, and overall forest health is being sacrificed. A harvest should be done consistent with this plan and should be marked, set up and administered by a consulting forester that can best represent the interests of the City of Kalamazoo.

Activity 1-2: A selective timber sale will be recommended again in approximately 10-15 years after the initial sale (2032). The purpose again is to remove excess growth as by that time stand densities will have again increased to a level that would be restricting stand growth.

Stand 2 – Black Walnut



Narrative Description: Stand 2 is a 4-acre Stand dominated by Black Walnut. The diameter distribution of this stand ranges from 6” to 32”. This stand has high wildlife value for whitetail deer, as the grassy undergrowth along with dead limbs provide an excellent habitat for whitetails to give birth. The Black Walnut in this stand is of significant economic value for harvesting soon. Black Walnut is by far the most sought-after species in the economic landscape in Michigan. The site index is 72 for Red oak.

Successional Trend: The successional trend for this stand is gradually toward a much younger walnut stand as many of the older trees are overmature and are slowly beginning to deteriorate, creating openings and gaps for the pole sized walnuts to develop into and openings for walnuts to regenerate themselves. There is a presence of Boxelder and Red maple which are much lower value species which can compete for space with the Black walnut, so efforts should be made to discriminate against these lower value species types. Walnut does a pretty good job of keeping other species at bay since they exude a natural Jugulone, which repels many other plant species. That said, Walnut will likely be the dominate species in this stand for the foreseeable future.

Objective: The primary objective for this stand is to manage for a healthy and sustainable stand of high-quality Black walnut trees. The best way to accomplish this is by periodic harvest of the mature and overmature trees. This creates a condition whereby the site will recruit new walnut seedlings where gaps in the canopy are created from a timber harvest. The recommendation is to maintain these stands in the 70-90 sq. ft. per acre basal area range and to do selective harvests at about 10-15-year intervals.

Soil and Water: The primary soil type for this stand is Oshtemo sandy loam with slopes ranging from 18 to 35 percent. This soil composition is well suited for timber harvesting activities during much of the year, however caution should always be exercised to avoid harvest operations during unseasonably wet periods such as late winter thaw or during periods when heavy spring rains are common, especially since this stand has some rather steep terrain.

Timber: Stand 2 is a previously unmanaged stand which consists primarily of Black Walnut along with an assortment of other hardwood species such as Black cherry, Boxelder, Hickory, and Red maple. The stand is an uneven-aged stand with diameters ranging from 6 to over 32 DBH. The current basal area of this stand is about 135 feet²/acre which illustrates that the stand is presently in an overstocked condition. Generally, once trees reach 20-22" DBH, they are at their peak for productivity and then trees begin a slowdown in growth rates. The Optimum density for maximum productivity for an uneven-aged timber stand, and to maintain overall forest health, is between 70-90 feet²/acre This site will continue to produce high quality Black walnut as long as it is sustainably managed on a periodic basis and the treatment is set up, marked and administered by a Registered Forester, who has the best interest of the City of Kalamazoo's objectives in mind.

Tree Size Class: 6"-32" DBH with many trees presently considered overmature.

Stand Density: 135 feet²/acre

Figure 13: Diameter Distribution of Stand 2 Timber:

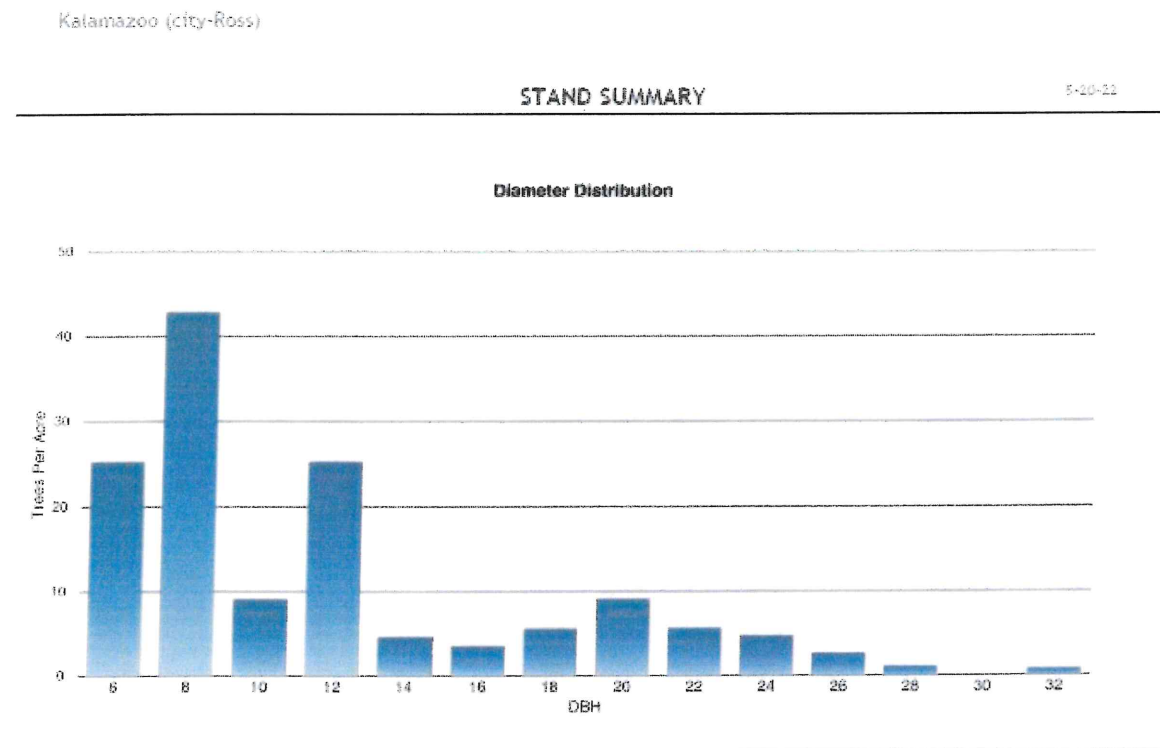
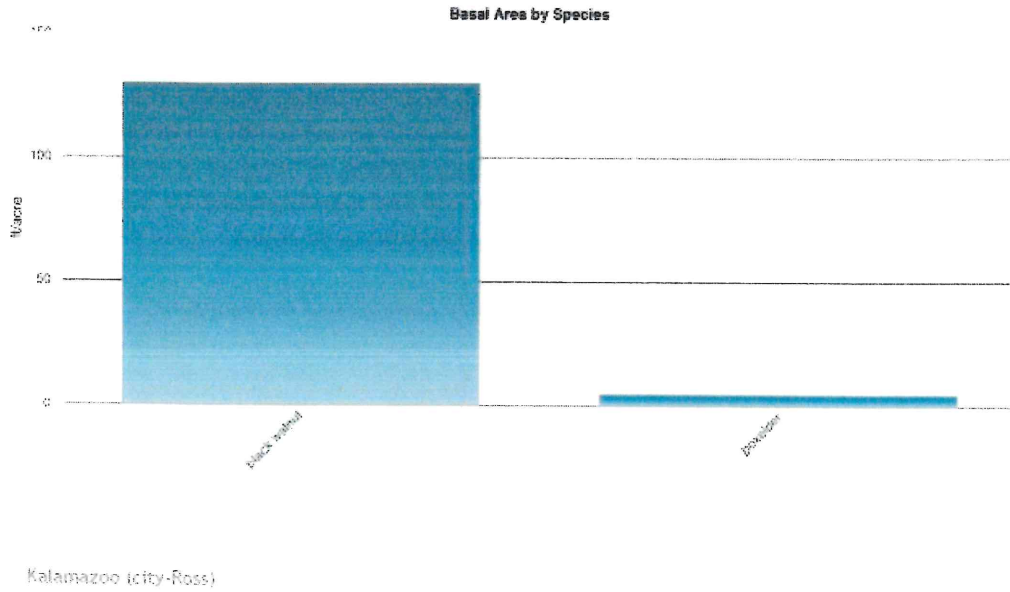
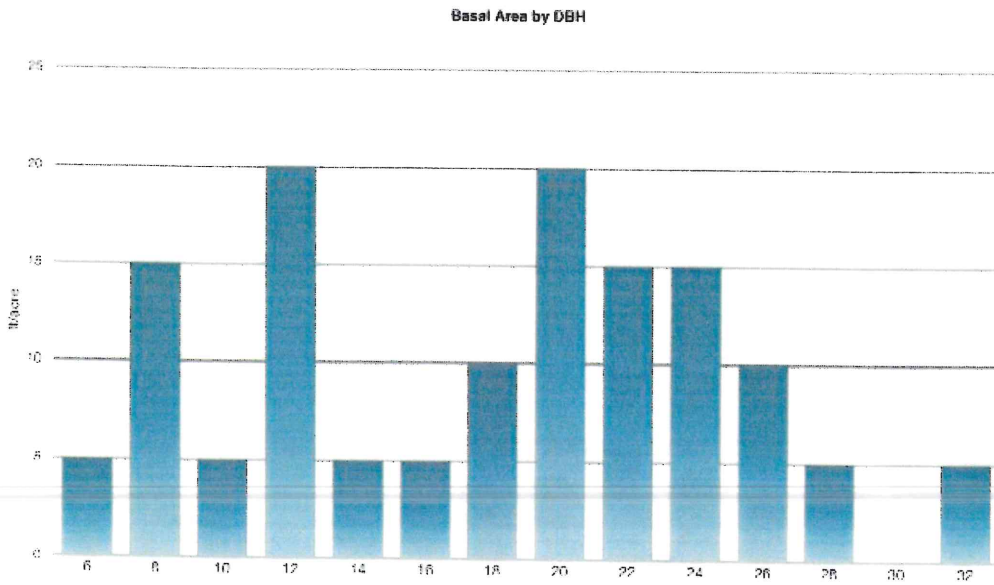


Figure 14: Summary of Stand 2 Basal Area:



STAND SUMMARY

5-20-23



Stand 2- Management Recommendations

Activity 2-1: Selective Timber Harvest

Timber Harvest Objectives: A selective harvest is recommended for this stand which would remove some of the largest diameter, more open grown trees that are considered overmature. These are taking up valuable growing space from intermediate sized trees that can are healthier and are able to grow higher quality timber at a faster rate. Most of these trees originated in an open setting years ago and many are very limby and are not high-quality specimens. A sustainable harvest now, leaving the most desirable growing stock of primarily 6-22" DBH trees at a proper density will improve the forest for timber, wildlife, recreation, aesthetics, and long-term ecological sustainability.

Activity 2-2: Selective Timber harvest

Stand #2 Forest Inventory Information

Kalamazoo (city-Ross)

STAND SUMMARY

5-20-21

STAND 2	Walnut	BA	135.0	TPA	141.4					
ACRES	4.0							4 PTS		
STATISTICAL ANALYSIS					VOLUME PER ACRE					
Confidence Interval	90%	BA	TPA	DBH	MHT	MBF	CORDS			
Average		135.0	141.4	13.2	61.1	14.07	19.90			
Sampling Error		26.1%	119.9%			71.4%	52.2%			
Probable Lower Limit		99.7				4.02	9.50			
Probable Upper Limit		170.3	310.9			24.12	30.29			
SPECIES COMPOSITION					VOLUME PER ACRE			TOTAL STAND VOLUME		
		BA	TPA	AVG DBH	AVG MHT	MBF	CORDS	MBF	CORDS	
		135.0	141.4	13.2	61.1	14.07	19.90	56.29	79.58	
black walnut		130.0	96.3%	135.0	13.3	62.5	14.07	18.80	56.29	75.19
boxelder		5.0	3.7%	6.4	12.0	32.0		1.10		4.40

Stand 3- Upland Mixed 29 acres



Narrative Description: Stand 3 is 29 acres of primarily an upland mixed stand consisting of primarily Black cherry, Red maple along with some scattered White pine, Red oak, Black Oak, White oak, Hickory and Elm. The stand appears to be primarily a successional forest that originated after the area was used for pasture or farming purposes many years ago. The topography of this stand is 6-12% slopes which has some of the gentlest terrain on the property as compared to surrounding Stands 1 and 4. The quality of the trees in this stand is lower than stand #1 as they have many lateral limbs from their originating in more open conditions. The stand is now overstocked with the Basal area at over 137ft² per acre and an improvement harvest is recommended. The Site index is 72 for Red oak in this stand.

Successional Trend: This stand is in an advanced stage of development of a successional forest that originated likely in old pasturelands. Species that invaded this site were predominantly Black cherry, a very sun living variety, along with Red maple, Red oak, Black oak, White oak and Hickory. Most of the younger White pine likely seeded in from the pine planting that happened likely about 50-70 years ago and some of the larger pines in Stand 3 were planted at the same time the Stand 4 planting was done.

Objective: The primary objective for this stand is to manage for a healthy and sustainable stand of high-quality mixed hardwoods and to maintain the White pine component for diversity. The best way to accomplish this is by periodic harvest of the mature and overmature trees. This creates a condition whereby the site will recruit more oak seedlings where gaps in the canopy are created from a timber harvest. The recommendation is to maintain these stands in the 60-70 sq. ft. per acre basal area range and to do selective harvests at about 10-15-year intervals. In addition, the group selection technique is appropriate to purposefully create more open conditions in pockets where oaks are present. The Oak Genus requires a great amount of sunlight. Invasive species control should be a component of any management treatment as additional sunlight will also stimulate these unwanted species.

Soil and Water: The soils of this stand are entirely made up of Oshtemo soils with a “C” slope of between 6-12 %. These soils have favorable characteristics for forest management activities and the use of heavy mechanical equipment during much of the year, however caution should always be exercised to avoid harvest operations during unseasonably wet periods such as late winter thaw or during periods when heavy spring rains are common, especially since this stand has some rather steep terrain.

Timber: Densely wooded area comprised of predominantly Red maple and Black cherry along with an assortment of Oaks and mixed Hickory along with some White pine. The oak species should be favored in this stand as much as possible. Timber quality is medium due to the high percentage of more open grown Cherry and Red maple, Black Oak, White oak and large White oak or Red oak in nearly every plot taken. The diameter distribution ranges from about 12 inches in diameter to about 32. However, there is a significant gap in the distribution with no trees sampled from 20 – 24 inches in diameter. The stand is dominated by white oak and red oak with smaller super maple and red maples in the understory. There is also a significant presence of intermediate sized white pine in the area.

Tree Size Class: Diameter distribution ranges from 6” to 26”

Stand Density: Basal area is estimated at about 137 ft²/acre.

Forest Health: The overall health of this stand is very good. No Oak wilt was observed in this stand, but an abundance of invasive species was found throughout. Invasive species is the primary forest health concern on many Southwest Michigan forests and Oriental bittersweet seems to be the most pressing forest health issue to address along with Honeysuckle, Multiflora rose & Autumn olive.

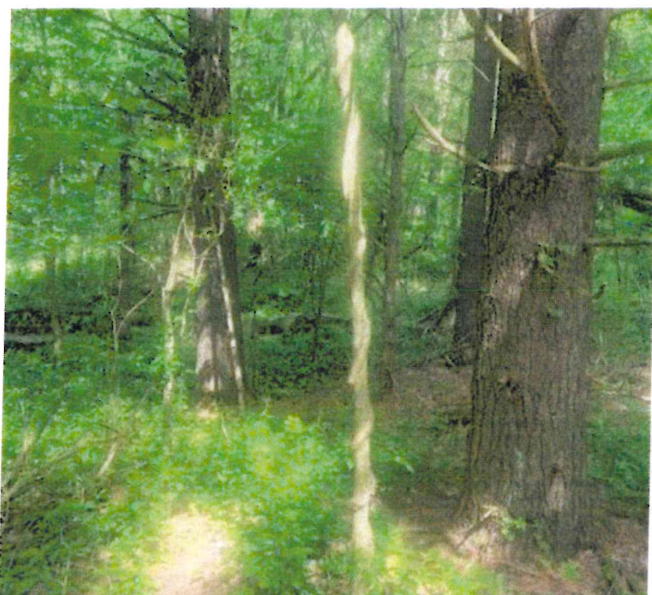


Figure 15 Oriental Bittersweet in understory and winding up into the canopy

Figure 16: Diameter Distribution of Stand 3 Timber:

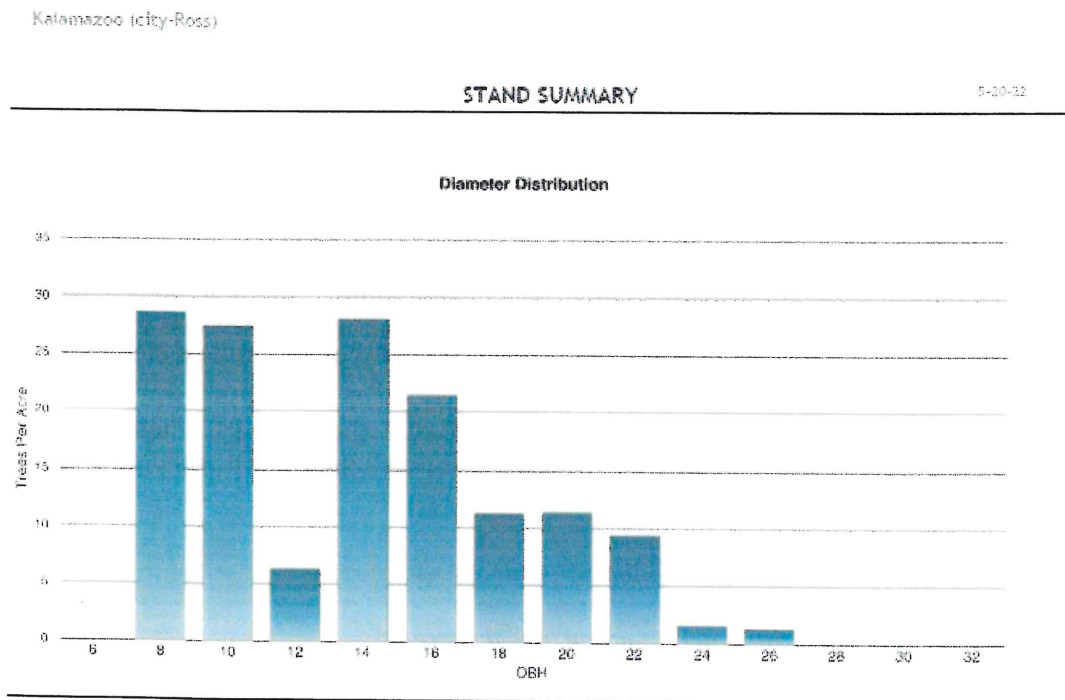
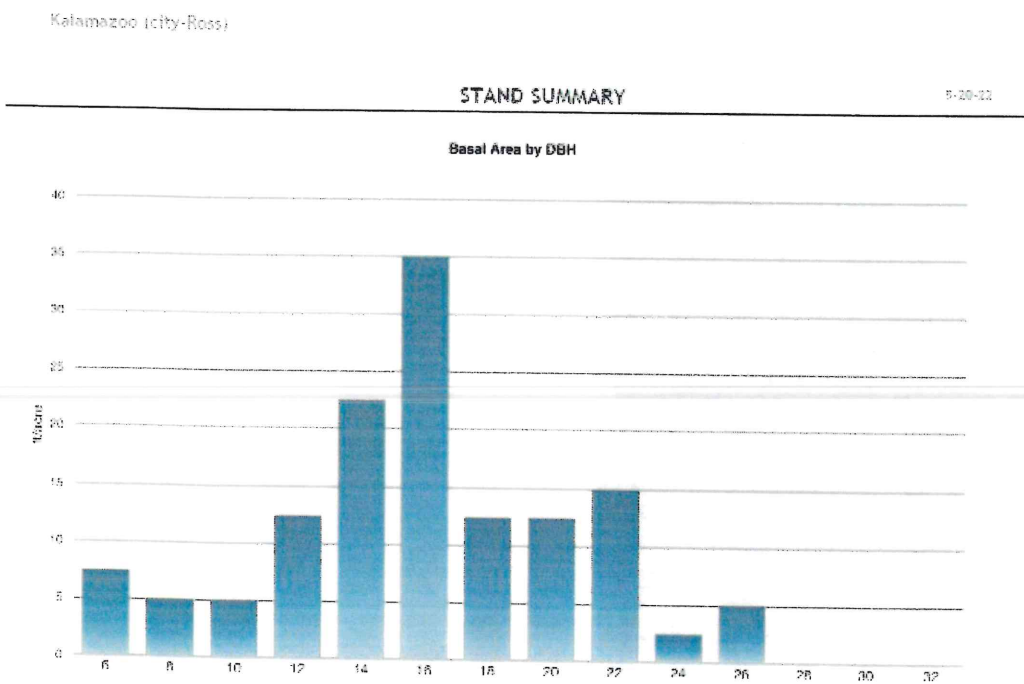
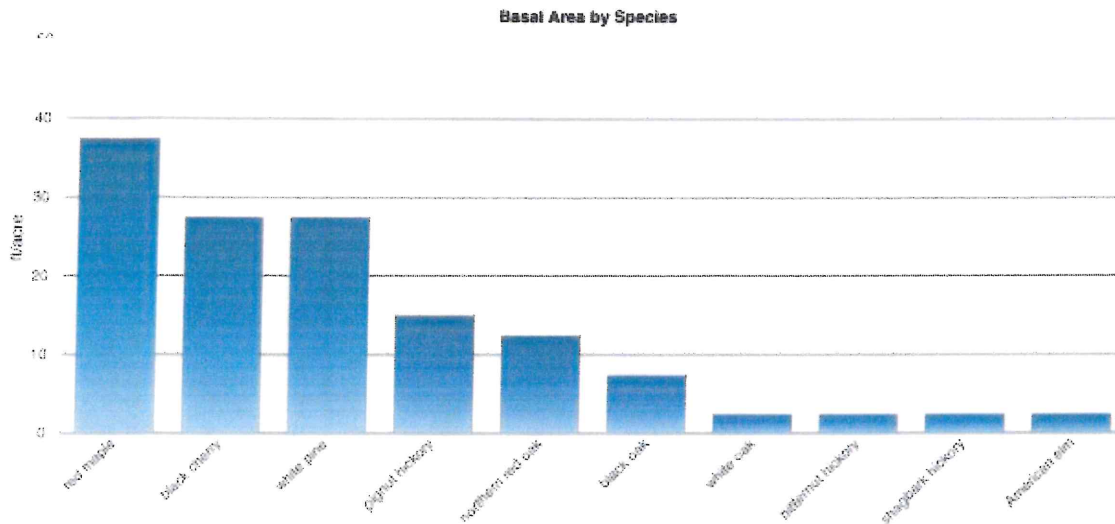


Figure 17: Summary of Stand 3 Basal Area:





Stand 3- Management Recommendations

Activity 3-1: Commercial Selection and Group Selection Timber Harvest to reduce the stand density back into the optimum range of between 60-80 ft² per acre, removing a mix of mature, overmature and declining trees to favor the healthiest trees for the long-term management of the forest.

Timber Harvest Objectives: The primary objective for any timber sale is to improve the forest, as defined according to the values of the landowner and the attributes of the forest. A timber sale should improve the species composition and growing conditions of remaining trees for future timber sales. In this instance we are wanting to focus management efforts on the growth and regeneration of all oak species along with Hickory, Red maple, Back Cherry and White pine. Over time, shade tolerant species such as the Red maple, Hickory and White pine can overtake the important oaks that are the most important species in this forest community. Forest management efforts should focus on creating openings or pockets in the canopy that will allow shade intolerant species such as Red and White oak to have an opportunity to prosper and regenerate. Timber harvests also improve the area for many species of wildlife and provide food, cover and a more diverse vegetative condition.

Timber Sale Timing: We recommend this stand is harvested within the next year or two in conjunction with Stands 1, 2 and 3 as these stands are all substantially overstocked and overall forest health is being sacrificed. A harvest should be done consistent with this plan and should be marked, set up and administered by a consulting forester that can best represent the interests of the City of Kalamazoo.

Activity 3-2: A selective timber sale will be recommended again in approximately 10-15 years after the initial sale (2032). The purpose again is to remove excess growth as by that time stand densities will have again increased to a level that would be restricting stand growth.

Stand #3 – Forest Inventory Information

Kalamazoo (city-Ross)

STAND SUMMARY

8-20-22

STAND 3 Upland Mixed BA 137.5 TPA 144.7

ACRES 29.0

8 PTS

STATISTICAL ANALYSIS

Confidence Interval	90%	VOLUME PER ACRE					
		BA	TPA	DBH	HHT	MBF	CORDS
Average		137.5	144.7	13.2	53.2	10.06	21.72
Sampling Error		19.0%	32.0%			20.4%	21.1%
Probable Lower Limit		110.3	97.1			7.70	17.13
Probable Upper Limit		164.7	192.1			13.94	26.31

SPECIES COMPOSITION

	BA		TPA		AVG		VOLUME PER ACRE		TOTAL STAND VOLUME	
	BA	%	TPA	%	DBH	HHT	MBF	CORDS	MBF	CORDS
	137.5		144.7		13.2	53.2	10.06	21.72	314.99	629.98
red maple	37.8	27.3%	46.9	32.4%	12.1	50.1	3.49	6.93	72.29	172.01
black cherry	27.5	20.0%	29.9	20.7%	13.0	54.5	3.10	4.52	60.93	131.13
white pine	27.5	20.0%	15.6	10.8%	10.0	54.5	2.39	4.54	69.26	131.71
pignut hickory	15.0	10.9%	23.2	16.0%	10.9	56.0	1.21	2.07	35.00	60.03
northern red oak	12.5	9.1%	9.9	6.8%	13.2	62.4	1.31	1.53	37.85	44.40
black oak	7.5	5.5%	6.1	4.2%	13.0	61.3	0.74	1.46	21.51	42.46
white oak	2.5	1.8%	2.3	1.6%	14.0	40.0	0.09	0.54	2.40	15.63
bitternut hickory	2.5	1.8%	1.0	0.7%	16.0	64.0	0.27	0.29	7.83	0.41
chagbark hickory	2.5	1.8%	1.0	0.7%	16.0	64.0	0.27	0.29	7.83	0.41
American elm	2.5	1.8%	7.2	5.0%	0.0	32.0		0.54		15.63

Stand 4- White pine/ Upland Mixed)



Narrative Description: This Stand is a mixture of older planted White pine and an Upland mixed forest condition like Stand #3, but with steeper topography descending to the wetland's component (Stand 5). The White pine component is the dominant volume in this stand with volunteer natural hardwoods consisting of Black cherry, Black oak and Red maple which is common in pine plantation areas. The Stand density is very high at 170 ft² per acre. Conifer plantations typically have about double the density and volume grown on a per acre basis. That said, White pine stands should be maintained at about 100-120 ft² per acre so the stand density is too high for optimum growth and the forest is quite stagnant. The Site index is 72 for Red oak for this management unit.

Successional Trend: This is primarily a planted stand of White pine. Most of this area was planted at an 8 foot by 8 foot spacing and was likely planted by hand as a conservation practice to protect water quality and minimize soil erosion. White pine is a native species in Michigan and is the State Tree. White pine is also shade tolerant so it will regenerate itself well and adds a component of species diversity in this otherwise almost entirely deciduous forest region of the State. White pine regeneration can be browsed heavily by white tailed deer in some instances so the successional trend may be impacted by deer, invasive species and the forest management treatments that are implemented. Landowner goals will largely influence the successional trend going forward.

Objective: The primary objective for this stand is to manage for a healthy and sustainable stand of high-quality mixed hardwoods and to maintain the White pine component for diversity. The best way to accomplish this is by periodic harvest of the mature and overmature trees. This creates a condition whereby the site will recruit more Oak seedlings where gaps in the canopy are created from a timber harvest. The recommendation is to maintain these White pine pockets in the 80-120 ft² / acre range, while maintaining a 60-70 ft² per acre basal area range in the hardwood dominated areas. Selective harvests at about 10–15-year intervals will help to accomplish these targets and the group selection technique can be used to favor oaks within this stand to purposefully create more open conditions in pockets where oaks are present. The Oak Genus requires a great amount of sunlight. Invasive species control should be a component of any management treatment as additional sunlight will also stimulate these unwanted species.

Soil and Water: The soils of this stand are entirely made up of Oshtemo soils with a "D" slope of between 12-18 %. These soils have favorable characteristics for forest management activities due to the soil texture being heavy to sand, but extra caution should be exercised due to the steeper slopes. Forest management treatments (Harvests) should be done during dry or frozen periods of the year. The use of any type of equipment during unseasonably wet periods such as late winter thaw or during periods when heavy spring rains are common should be avoided.

Timber: Markets for white pine timber are scarce in southern Michigan, but white pine can make excellent lumber for hobby markets and most buyers can move some white pine trees if they are larger diameter and pine is a small component of a larger hardwood timber sale. The high density of the stand and the need to improve forest health point to a managed timber harvest to be performed in conjunction with the other stands on this Ross Township property.

Tree Size Class: The diameter distribution is from 8" to 26" DBH.

Stand Density: The Stand density is estimated at 170 ft²/ Acre.

Forest Health: The overall health of this stand is very good. No Oak wilt was observed in this stand, but an abundance of invasive species was found throughout. Invasive species is the primary forest health concern on many Southwest Michigan forests and Oriental bittersweet seems to be the most pressing forest health issue to address along with Honeysuckle, Multiflora rose & Autumn olive.

Figure 18: Diameter Distribution of Stand 4 Timber:

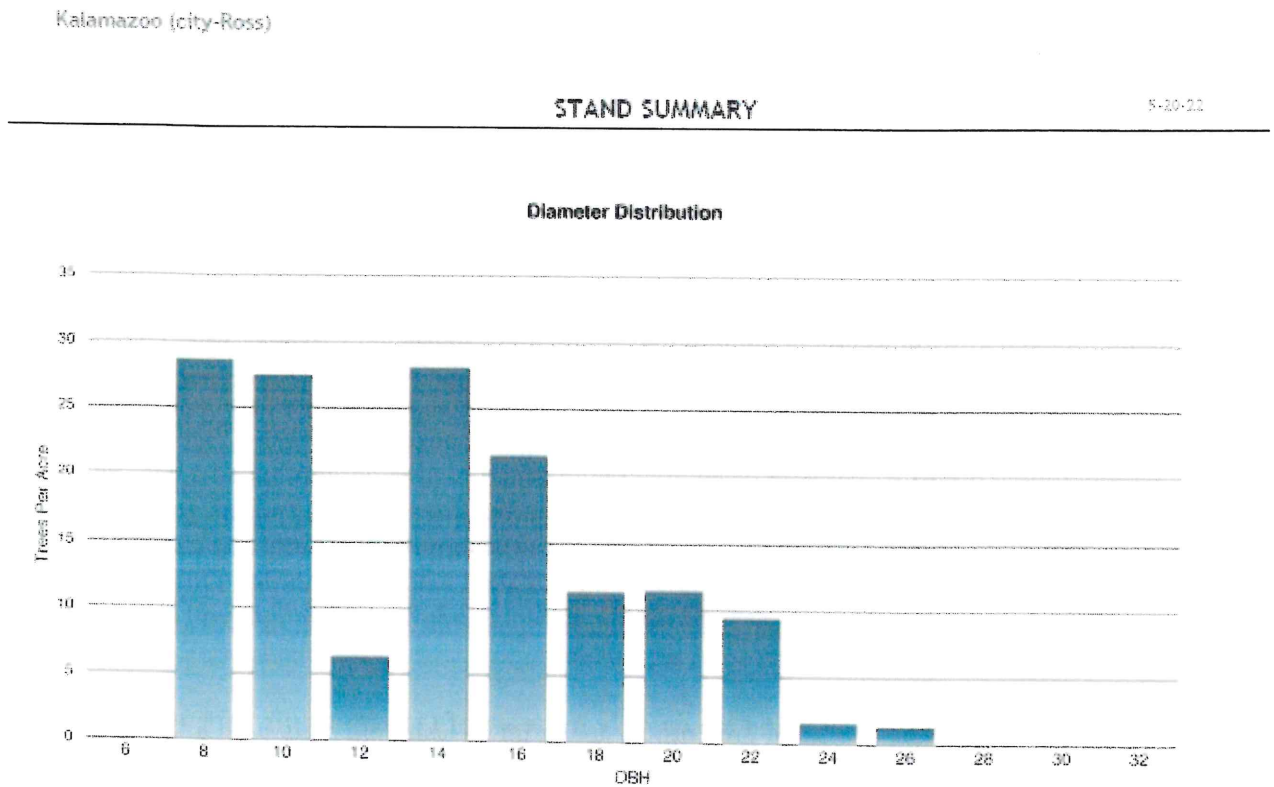
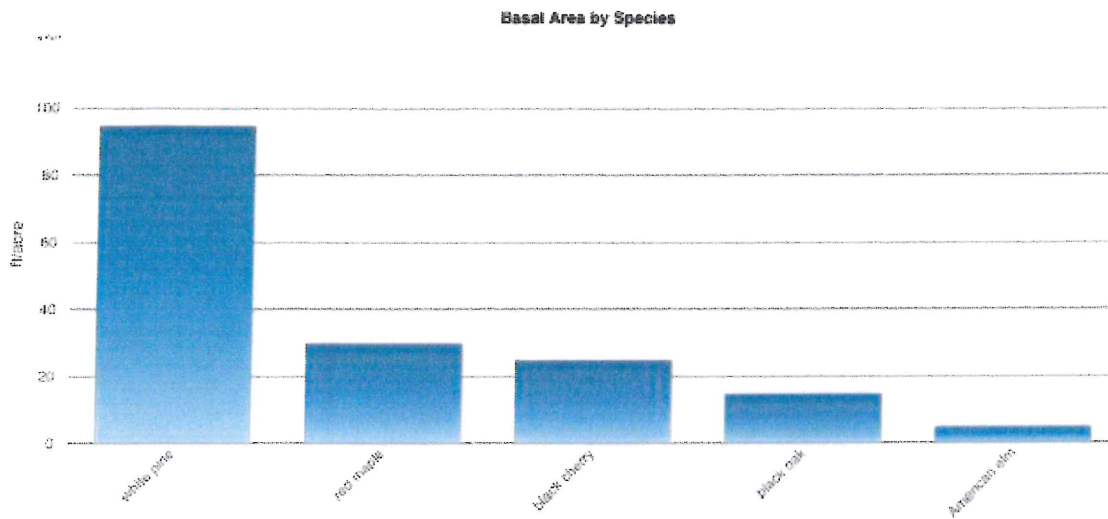


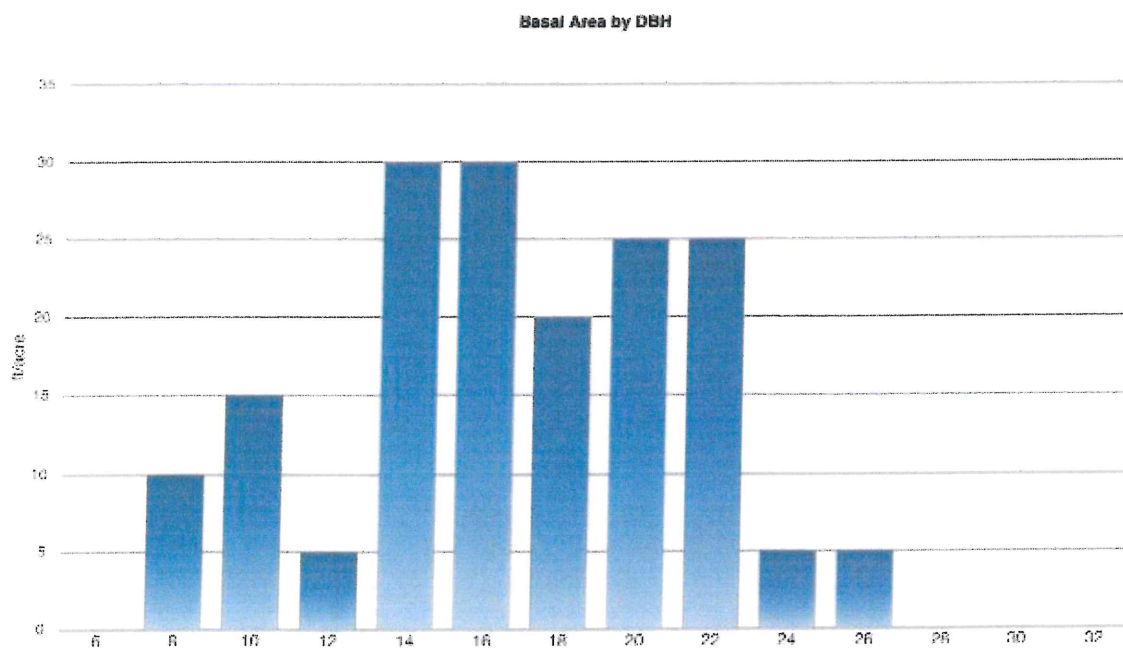
Figure 19: Summary of Stand 4 Basal Area:



Kalamazoo (city-Ross)

STAND SUMMARY

8-20-22



Stand 4- Management Recommendations

Activity 4-1: Timber harvest (2023)

Timber Harvest Objectives: The primary objective for any timber sale is to improve the forest, as defined according to the values of the landowner and the attributes of the forest. A timber sale in this stand should reduce the density back into the optimal range for forest health and improve timber growth. In addition, the White pine is an old plantation which should be thinned to increase the Oak and hardwood component while leaving good quality White pine trees on a much wider spacing to improve the visual appearance into a more natural one, while encouraging natural hardwood and White pine regeneration. Forest management efforts should focus on creating openings or pockets in the canopy that will allow shade intolerant species such as Red and White oak to have an opportunity to prosper and regenerate. Timber harvests also improve the area for many species of wildlife and provide food, cover, and a more diverse vegetative condition.

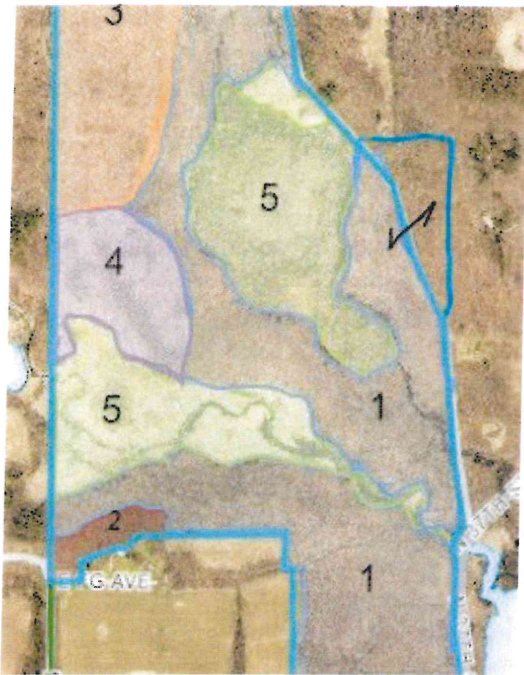
Activity 4-2: Timber Harvest (2033)

Stand 4 – Forest Inventory Information:

Kalamazoo (city-Ross)

STAND SUMMARY										
STAND: 4	White pine/Upland mixed		BA 170.0	TPA 147.3						
ACRES 14.0									4 PTS	
STATISTICAL ANALYSIS					VOLUME PER ACRE					
Confidence Interval 90%	BA	TPA	DBH	HGT	MBF	CORDS				
Average	170.0	147.3	14.5	59.5	16.51	26.32				
Sampling Error	35.6%	10.9%				71.5%	27.3%			
Probable Lower Limit	107.7	119.4				4.71	19.14			
Probable Upper Limit	232.3	175.1				28.31	33.49			
SPECIES COMPOSITION										
	BA	TPA	AVG DBH	AVG HGT	VOLUME PER ACRE		TOTAL STAND VOLUME			
	170.0	147.3	14.5	59.5	16.51	26.32	231.13	365.44		
white pine	95.0	55.9%	65.0	16.2	50.6	10.95	14.16	153.29	193.23	
red maple	30.0	17.6%	21.5	16.0	50.7	2.89	3.95	39.51	55.29	
black cherry	25.0	14.7%	26.4	11.2	51.2	1.31	4.71	10.30	65.93	
black oak	15.0	8.8%	9.1	17.4	50.7	1.40	2.26	19.93	31.69	
American elm	5.0	2.9%	14.3	6.0	40.0		1.24		17.29	

Stand 5- Wetland(s)



Narrative Description: This 59-acre Management Unit is considered Wetlands, which is the most important feature of this unique property. In fact, writing a forest management plan to address the importance of forests in the protection of water quality cannot be understated. Forest lands described in this plan completely border all portions of this diverse unit. This unit includes important drainages between Three Lakes and Mill Pond which are a regional feature, not to mention its proximity to the City of Kalamazoo, the City of Battle Creek and Gull Lake. Forest management prescriptions and treatments should prioritize the protection of water quality and limiting soil erosion by employing the Michigan Department of Natural Resources - Best Management Practices for water quality. Wetlands provide several other benefits including incredible wildlife habitat and enriching the diversity of the adjacent forest lands covered in this plan. This is a forestry plan so, as foresters, our specialty and expertise is not in managing the wetlands themselves, but in prescribing management practices that help protect and sustain these most important and most fragile parts of the ecosystem.

Objective: Due to the fragile nature of this unit, no forest management treatments are appropriate, and “PROTECTION” of this valuable resource is our objective as foresters and indeed that of the City of Kalamazoo.

Soil and Water: The soils in this management unit are exclusively Houghton series soils which are flat and mostly inundated by water the year around.

Timber: N/A

Stand 5- Management Recommendations: N/A

Desired Future Conditions

Forestry management activities are meant to accomplish the landowner's goals for that stand and to bring about desired future conditions for the forest. The goals for the entire property include recreation, maintaining aesthetics, conducting sustainable timber harvests, maintaining excellent wildlife habitat, and protecting soil and water quality.

General Activities for the Entire Property

Activity 0-1: Consider joining American Tree Farm System and Michigan Forest Association.

The Tree Farm System (www.treefarmssystem.org) provides forest "certification" to verify that forests are sustainably managed. Certified forest products sometimes have a higher retail price, but do not often generate higher prices for the forest owner. The minimum requirements are ten acres of forest, a current written management plan, compliance with the eight principles of the American Tree Farm System (listed in the Appendix), and a free inspection by a certified Tree Farm Inspector. There is no additional cost for you after this Forest Stewardship Plan is written.

You may also want to consider joining other forest landowner groups.

According to USFS research, only 4% of non-industrial, private forest owners have a written forest management plan (Butler, 2008). Your investment in this management plan puts you into an elite group of forest owners! I believe that you may enjoy spending time with other active and involved forest owners. The Michigan Forest Association (MFA) is an organization of private forest owners in Michigan and costs around \$40 in annual dues (www.michiganforests.com). MFA provides useful forest management information (magazines, newsletters, emails) and opportunities for networking with other landowners (annual conferences, workshops, and field days).



Activity 0-2: Monitor Forest Health Annually

Forest health is an issue of moderate concern with Emerald ash borer already present and a potential for Oak wilt. I recommend monitoring the forest regularly (each year and during different seasons) for changes that may indicate additional insect or disease problems. The "Forest Health Highlights" publication about forest insects and diseases is a great resource updated annually and available at www.michigan.gov/foresthealth. There are several new insects and diseases that are not yet present in Michigan but are in nearby states, so landowners should monitor their forest and report any unusual problems to the DNR for an early response (Asian longhorn beetle for maple, Thousand cankers of walnut, etc.). To report an unusual insect or disease in your forest, please contact Roger Mech, the DNR Forest Health Monitoring Specialist, at MechR@michigan.gov, or 517-243-0300.

Integrated Pest Management (IPM) should be practiced protecting soil and water. IPM requires correctly identifying pests, setting an economic or action threshold, and then implementing the best method to control the pest. IPM actions may include cultural, mechanical, biological, and chemical controls. Chemical pesticides are a useful tool but should not be the first or only choice to control pests. For example, the best way to prevent Oak wilt is the cultural practice of not wounding oaks between April and July. If Oak wilt does become established, the primary action is a mechanical control of severing roots to prevent the spread of the fungus through root grafts.

Asian longhorn beetle on maple trees: This disease is not in Michigan yet but because Sugar maple and red maple populations are present on the ownership it is a good idea to be aware of this potential forest health issue.

Emerald ash borer: The Emerald ash borer (EAB) is an exotic pest that is attracted to both healthy and dying ash trees. All living ash trees ≥ 16 " DBH should be included in the next timber sale. Harvest smaller diameter ash trees for firewood. This County is within the Level One Quarantine Area so logs or firewood cannot legally leave the Lower Peninsula. Girdled trees could be left standing to provide tall snags for wildlife, but ash crowns quickly become brittle and fall apart. See www.emeraldashborer.info for more information about EAB.

Oak wilt: Oak wilt is caused by a fungus that can be transported by bark beetles, but more commonly is spread by root grafts. The Red oak group of oaks (Red oak, Black oak, Pin oak) is more susceptible to oak wilt than the White oak group of oaks (White oak, Bur oak, Swamp white oak, Chinkapin oak). It is a better option to work toward preventing Oak wilt in the first place than it is to treat a stand after infection. One preventative measure that the Michigan DNR recommends is to avoid harvest activity during the three-month period when the beetles are most active. The beetles that can spread the disease are typically most active from April to July when the trees are most actively growing. Ideally, Timber sales that are conducted in the fall or winter months are best, but this is not always possible due to wet soils, timber markets or other competing uses of the forest. Oak wilt incidences vary across the State of Michigan. There are many oak areas in Michigan where Oak wilt has not been confirmed and Oak wilt transmission risk would be extremely low. However, treating oak stands near where there are confirmed Oak wilt incidences, it would be particularly important to avoid pruning or wounding to oak trees during the three-month window previously stated. <http://na.fs.fed.us/fhp/ow/>. (See appendix for a map of Oak wilt distribution in the state)

Beech bark disease: Beech bark disease (BBD) is initiated by a scale insect that attaches to the tree and feeds on its sap. The tiny scale (~1 mm) secretes a white, wooly, waxy covering and the trunks look like they are covered in white powder. The scale feeding damage allows a fungus to invade the tree, which inhibits the flow of sap, which causes a general decline in tree health and eventually kills the tree. Controlling the natural spread of BBD is not feasible because both the scale and fungus are moved by the wind. If the scale is not in your forest, consider reducing the amount of beech in your forest so that beech is <20% of the stand basal area. If beech scale is already present, harvest the infected trees. Do not move infested firewood as this will spread the scale and fungus that causes beech bark disease. See <http://na.fs.fed.us/fhp/bbd/>. (See appendix for a map of BBD distribution in the state)

Forest Health: Invasive species such as autumn olive, oriental bittersweet, honeysuckle and multiflora rose can quickly overtake this stand limiting growth and regeneration of native species. More information on invasive species can be found at: <https://mnfi.anr.msu.edu/publications/best-control-practice-guides>.

Summary Table

The previously recommended activities are summarized in Table 1. This table includes space for you to make notes about your management decisions over the next twenty years. See the descriptions above for the proper season to conduct management activities. The timing of timber sales should be based primarily upon biological considerations like stand age, density, and forest health issues, but timing can be modified by several years according to other factors including economics (timber prices, income needs, and taxes) or landowner preferences.

Table 2. Summary of Recommended Management Activities for the Next Twenty Years

Stand	#	Acres	Activity Description	Dates		Silvicultural System
				Planned	Complete	
Entire Forest	0-1		Join Tree Farm	2022		
Entire Forest	0-2		Monitor Forest Health	Annual		
Entire Forest		168	Invasive species Control	ASAP		
1	1-1	121	Timber harvest	2023		Selective/ group selection
2	2-1	4	Timber harvest	2023		Selective/ group selection
3	3-1	29	Timber harvest	2023		Selective/ group selection
4	4-1	14	Timber harvest	2023		Selective/ group selection
5	5	59	PROTECTION			

After the Harvest

After a commercial timber harvest has occurred there will be slash left behind on the ground. [Slash is typically the tops of trees that are too small in diameter to be usable as sawlogs, are not straight enough to saw or are damaged in the logging process- this is region/mill/logger specific]. To some people this slash could look unappealing, but to natural resource professionals slash is an important part of the local ecosystem. The slash will provide protective cover for small mammals from predators as well as protective cover for natural regeneration from deer. Slash is also an especially important part of nutrient cycling for the forest.

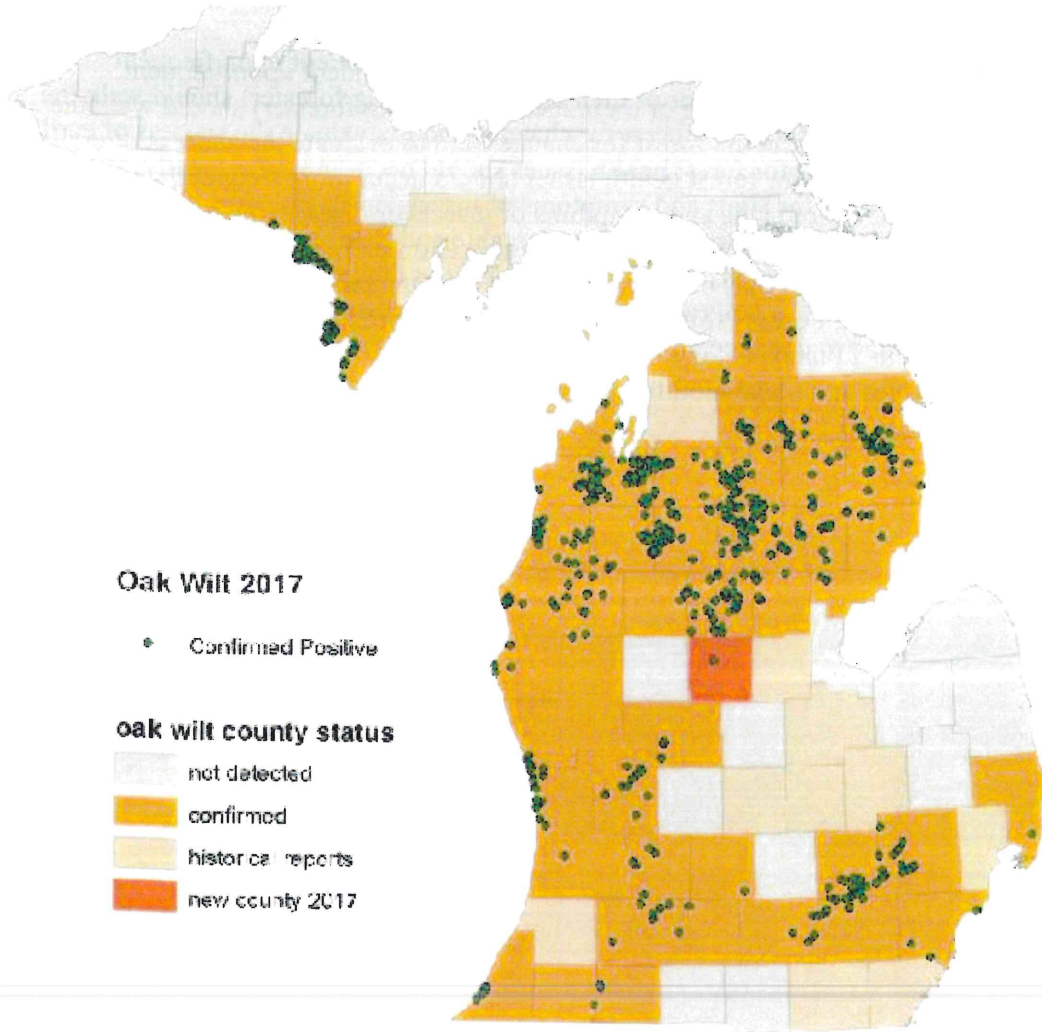
Monitoring

The successful implementation of this Forest Stewardship Plan is dependent upon frequent monitoring by the landowner. The landowner or their agent (consulting forester) should walk the entire forest at least annually to inspect the forest for changes and to evaluate the success of earlier management activities. Monitoring for forest health issues should occur more frequently, at least two or three times a year, to look for signs and symptoms of insects or disease during different seasons. All Forest Stewardship Plans should also be adaptable and flexible enough to accommodate changes in landowner goals or forest resources over the ten to twenty-year planning period. Plans for the Commercial Forest Program must allow for record keeping of silvicultural practices and amendments due to unexpected events or natural disasters. Please use the table at the end of this plan to record notes and make modifications to this plan as needed.

Appendix – General Forestry Information

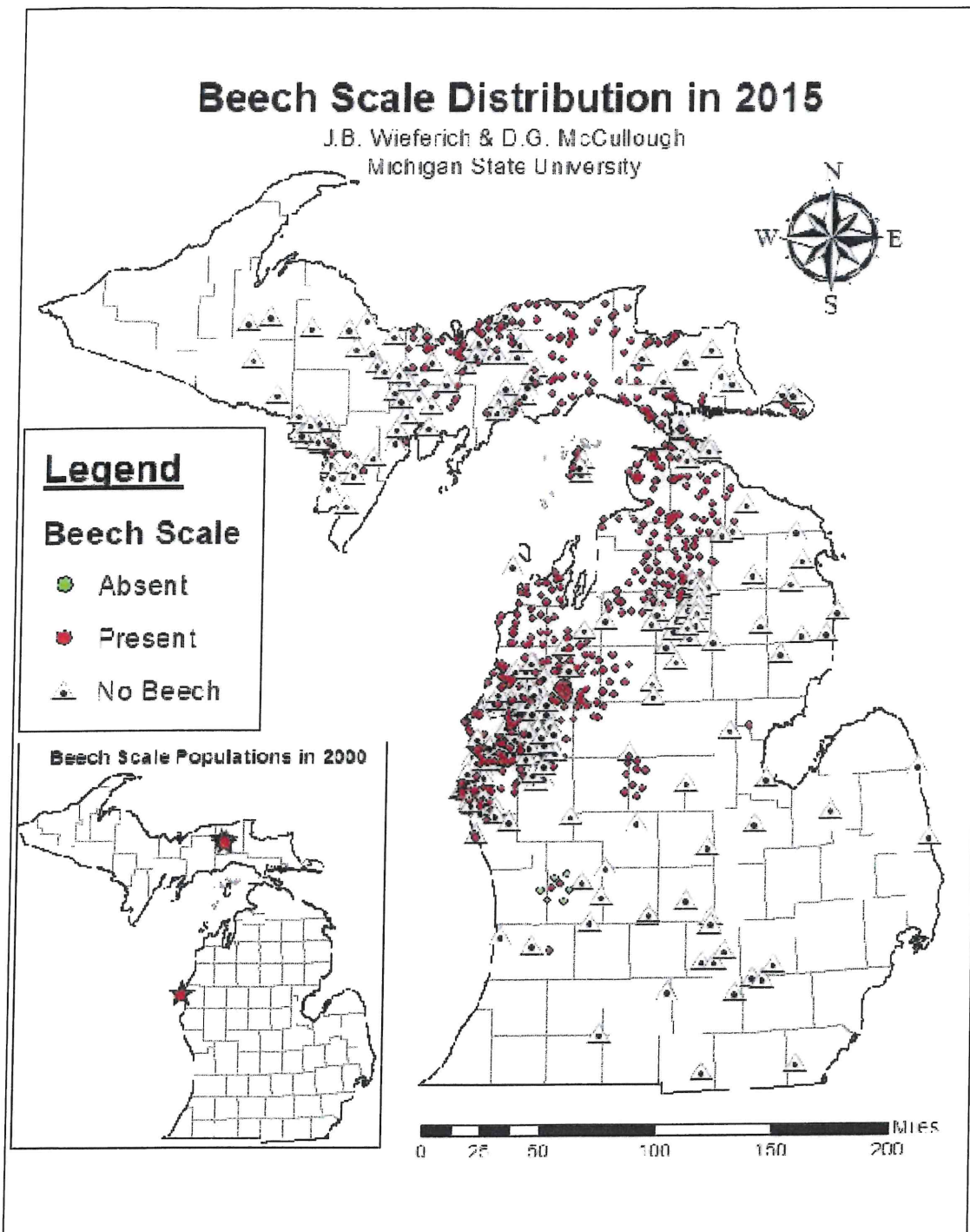
*Map of Oak Wilt Distribution **

This map shows the distribution of Oak wilt by county in 2017. For more information of Oak wilt go to www.michiganoakwilt.org. An interactive map (Oak wilt viewer) is at the bottom of the web page. There are no confirmed cases of Oak wilt in Van Buren County at this time, but annual monitoring is encouraged.



*Oak wilt has been confirmed in the Richland Area of Kalamazoo County

Map of Beech Bark Disease Distribution



Glossary of Common Forestry Terms

The following glossary is adapted from www.dnr.state.md.us/forests/gloss.html.

Agroforestry: a land-use system that combines both agriculture and forestry in one location. Alley

Cropping: widely spaced rows of trees with annual crops growing in between the rows.

Basal Area (of a Tree): the cross-sectional area of a tree trunk at 4.5 feet off the ground and expressed in units of square feet (ft²).

Basal Area (of a Forest): the basal area of all trees on an acre of land is summed up for the basal area of a forest and expressed in ft²/acre; used as a measure of forest density.

Biomass: harvesting and using whole trees or parts of trees for energy production

Board Foot: a measure of volume 1 foot by 1 foot by 1 inch or 144 cubic inches of wood.

Bolt: 8-foot-long log

Browse: parts of woody plants, including twigs, shoots, and leaves, eaten by forest animals.

Carbon Cycle: the bio-geochemical cycle to exchange carbon between the biosphere and atmosphere by means of photosynthesis, respiration, and combustion.

Clear-cut: the harvest of all the trees in an area to reproduce trees that require full sunlight.

Co-dominant Tree: a tree that extends its crown into the canopy and receives direct sunlight from above but limited sunlight from the sides.

Commercial Forestland: forest capable of producing 20ft³ of timber per acre per year.

Commercial Treatments: timber stand improvements that generate income from sale of trees.

Cord: a unit of wood cut for fuel that is equal to a stack 4 x 4 by 8 feet or 128 cubic feet

Cordwood: small diameter or low-quality wood suitable for firewood, pulp, or chips.

Crop Tree: a young tree of a desirable species with certain desired characteristics.

Crown: the uppermost branches and foliage of a tree.

Crown Classes: see dominant, co-dominant, intermediate, and suppressed.

Crown Cover or Crown Closure: the percentage of a given area covered by tree crowns.

Crown Ratio: the ratio of the leaved portion of a tree's height to its total height.

Cruise: a forest survey used to obtain inventory information and develop a management plan.

Cull: a sawtimber size tree that has no timber value because of poor shape or damage. Diameter at

Diameter Breast Height (DBH): measurement of the tree trunk diameter taken at 4 1/2 feet.

Diameter-Limit Sale: a timber sale in which all trees over a specified DBH may be cut. A Diameter-limit sale often results in high grading the woodlot and is a poor forestry practice.

Dominant Trees: trees that extend their crown above surrounding individuals.

Even-Aged Stand: a stand in which the age difference between the oldest and youngest trees is minimal, usually no greater than ten to twenty years.

Forest Farming: cultivating high value specialty crops in the shade of natural forests.

Forest Stand Improvement (FSI): any practice that increases the health, composition, value, or rate of growth in a stand. Also called Timber Stand Improvement when focused on timber.

Forest Types: associations of tree species that have similar ecological requirements.

Group Selection: a process of harvesting patches of trees to open the forest canopy and encourage the reproduction of uneven aged stands.

Habitat: the ecosystem in which a plant or animal lives and obtains food and water.

Hardwoods: a general term encompassing broadleaf, deciduous trees.

High Grading: to remove all good quality trees from a stand and leave only inferior trees.

Intermediate Tolerance: a characteristic of certain tree species that allows them to survive, though

not necessarily thrive, in relatively low light conditions.

Intolerance: a characteristic of certain tree species that does not permit them to survive in the shade of other trees.

Landing: a cleared area within a timber harvest where harvested logs are processed, piled, and loaded for transport to a sawmill or other facility.

Log Rule: a method for calculating wood volume in a tree or log by using its diameter and length. Scribner, Doyle and the International 1/4-inch rule are common log rules.

Lump-Sum Sale: a timber sale in which an agreed-on price for marked standing trees is set before the wood is removed (as opposed to a mill tally or unit sale).

Mast: nuts and seeds such as acorns, beechnuts, and chestnuts that serve as food for wildlife.

Merchantable Height: the point on a tree stem to which the stem is salable.

Over-mature: trees that have declined in growth rate because of old age and loss of vigor.

Overstocked: the situation in which trees are so closely spaced that they compete for resources and do not reach full growth potential.

Over-story: forest canopy that includes dominant, co-dominant, and intermediate trees.

Overtopped: a tree cannot sufficiently reach the over-story and receive direct sunlight.

Pole Timber: trees 4 to 10 inches DBH.

Pre-Commercial Operations: cutting to remove wood too small to be sold.

Prescribed Fire: an intentional and controlled fire used as a management tool used to reduce hazardous fuels or unwanted understory plants (invasive, undesirable species, etc.).

Pulpwood: wood suitable for use in paper manufacturing.

Range: cattle grazing in natural landscapes.

Regeneration: the process by which a forest is reseeded and renewed.

Regeneration Cut: a timber harvest designed to promote natural establishment of trees.

Release: to remove overtopping trees that competes with understory or suppressed trees.

Residual Stand: the trees remaining intact following any cutting operation.

Riparian Forest Buffers: strips of land along stream banks where trees, shrubs and other vegetation are planted and managed to capture erosion from agricultural fields.

Salvage Cut: the removal of dead, damaged, or diseased trees to recover value. Sapling - a tree at least 4 1/2 feet tall and between 1 inch and 4 inches in diameter.

Saw-bolt: an 8-foot-long sawlog.

Saw-log: log large enough to be sawed economically, usually >10" diameter and 16' long.

Saw-timber stand: a stand of trees whose average DBH is greater than 11 inches.

Sealed-Bid Sale: a timber sale in which buyers submit secret bids.

Seed Tree: a mature tree left uncut to provide seed for regeneration of a harvested stand.

Seed Tree Harvest: the felling of all the trees in an area except for a few desirable individuals that provide seed for the next forest.

Selection Harvest: the harvest of individual trees or small groups at regular intervals to maintain an uneven-aged forest.

Shelter-wood Harvest: the harvest of all mature trees in an area in a series of two or more cuts, leaving enough trees of other sizes to provide shade and protection for forest seedlings.

Silvo-pastures: trees and improved forages to provide suitable pasture for grazing livestock.

Silviculture: the art and science of growing forest trees.

Site: the combination of biotic, climatic, topographic, and soil conditions of an area.

Site Index: a measure of the quality of a site based on the height of dominant trees at a specified

age (usually fifty years), depending on the species.

Site Preparation: treatment of an area prior to reestablishment of a forest stand.

Skidder: a rubber-tired machine with a cable winch or grapple to drag logs out of the forest.

Skidding: the act of moving trees from the site of felling to a leading area or landing.

Slash: branches and other woody material left on a site after logging.

Snag: a dead tree that is still standing. Snags provide important food and cover for a wide variety of wildlife species.

Softwood: any gymnosperm tree including pines, hemlocks, larches, spruces, firs, and junipers.

Stand: a group of forest trees of sufficiently uniform species composition, age, and condition to be considered a homogeneous unit for management purposes.

Stand Density: the quantity of trees per unit area, usually evaluated in terms of basal area, crown cover and stocking.

Stocking: the number and density of trees in a forest stand. Stands are often classified as understocked, well-stocked or overstocked.

Stumpage Price: the price paid for standing forest trees.

Succession: the natural replacement of one plant (or animal) community by another over time in the absence of disturbance.

Suppressed: a tree condition characterized by low growth rate and low vigor as a result of competition with overtopping trees. See overtopped.

Sustained Yield: an ideal forest management objective in which the volume of wood removed equals growth within the total forest.

Thinning: a partial cut in an immature, overstocked stand of trees used to increase the stand's value growth by concentrating on individuals with the best potential.

Threatened Species: a species or subspecies whose population is so small or is declining so rapidly that it may become endangered in all or a significant portion of its range.

Tolerance: the capacity of a tree species to grow in shade

Under-stocked: a stand of trees so widely spaced, that even with full growth potential realized, crown closure will not occur.

Understory: the level of forest vegetation beneath the canopy.

Uneven-Aged Stand: Three or more age classes of trees represented.

Unit Sale: a timber sale in which the buyer makes regular payments based on mill receipts.

Veneer Log: a high-quality log of a desirable species suitable for conversion to veneer.

Well-Stocked: the situation in which a forest stand contains trees spaced widely enough to prevent competition yet closely enough to utilize the entire site.

Wildlife Habitat: native environment of an animal that includes food, water, cover and space.

Windbreaks: rows of trees to provide shelter for crops, animals, or farm buildings

Federal and State Laws Related to Forest Management

- USA - Federal Insecticide, Fungicide, and Rodenticide Act, 1947
- USA - National Historic Preservation Act, 1966
- USA - Clean Water Act, 1948 and 1972
- USA - Endangered Species Act, 1973
- MI - Michigan Pesticide Control Act, Public Act 171 of 1976
- MI - Natural Resources and Environmental Protection Act, Public Act 451 of 1994
- MI - Right to Forest Act, Public Act 676 of 2002

Best Management Practices

Best Management Practices (BMPs) are guidelines published by the State of Michigan to protect Michigan's water resources from non-point source pollution and erosion while working on forest land. BMPs are now called "Sustainable Soil and Water Quality Practices on Forest Land" and the document is online at www.Michigan.gov/PrivateForestLand. BMPs include proper location and construction of logging roads, the use of riparian management zones, installation of culverts and other stream crossings, proper use of pesticides and other chemicals, and site preparation for planting. BMPs also include the proper seasonal timing of activities to minimize the spread of insects or disease. Any forest management activities should minimize soil erosion near wetlands and surface water. Tree Farm certification requires compliance with best management practices.

Forest Health

The DNR publishes the annual "Forest Health Highlights" that has information about the forest insect and disease problems in Michigan. See www.Michigan.gov/ForestHealth for a pdf of the most recent edition. To report an unusual insect or disease in your forest, please email several photos to DNR-FRD-Forest-Health@Michigan.gov.

DNR Forest Health - www.Michigan.gov/ForestHealth
DNR Invasive Species Info - www.Michigan.gov/InvasiveSpecies
MDARD Exotic Forest Pests - www.Michigan.gov/ExoticPests
USFS Forest Health - <http://fhm.fs.fed.us/>

Wildlife Habitat

The DNR Wildlife Division has an excellent publication on managing wildlife habitat at www.michigandnr.com/publications/pdfs/huntingwildlifehabitat/Landowners_Guide/index.htm.

DNR Wildlife Division - www.Michigan.gov/Wildlife
Michigan United Conservation Clubs - <https://mucc.org>
Quality Deer Management Association - www.qdma.com
Audubon Society - www.MichiganAudubon.org
Foresters for the Birds - <http://vt.audubon.org/foresters-birds>
Ruffed Grouse Society - www.RuffedGrouseSociety.org
National Wild Turkey Federation - www.nwtf.org
Michigan Trout Unlimited - www.MichiganTU.org
US Fish and Wildlife Service - www.fws.gov/partners

Forest Economics

Capital Gains Tax Information. Profits from timber sales are taxed as capital gains, rather than ordinary income, if you own the timber for more than twelve months. Expenses, including the cost of a management plan or a consulting forester's fees for a timber sale, can be deducted from profits. There are many great tax related resources available on www.TimberTax.org, including the most recent edition of the annual "Tax Tips for Forest Landowners."

American Tree Farm System- Standards of Sustainability

I recommend that you join the American Tree Farm System to certify your exemplary and sustainable forest management. A free inspection from one of the 145 Tree Farm Inspecting Foresters is required to enroll. This Forest Stewardship Plan complies with the Farm System's eight Standards of Sustainability listed below. See www.TreeFarmSystem.org for information about the Tree Farm program, forest certification, and the full Standards of Sustainability.

1. **Commitment to Practicing Sustainable Forestry.** Forest owner demonstrates commitment to forest vitality by developing and implementing a sustainable forest management plan.
2. **Compliance with Laws.** Forest management activities comply with all relevant federal, state, and local laws, regulations, and ordinances.
3. **Reforestation and Afforestation.** Forest owner completes timely restocking of desired species of trees on harvested sites and non-stocked areas where tree growing is consistent with land use practices and the forest owner's management objectives.
4. **Air, Water, and Soil Protection.** Forest management practices maintain or enhance the environment and ecosystems, including air, water, soil, and site quality.
5. **Fish, Wildlife and Biodiversity.** Forest management activities contribute to the conservation of biodiversity.
6. **Forest Aesthetics.** Forest management plans and management activities recognize the value of forest aesthetics.
7. **Protect Special Sites.** Special sites are managed in ways that recognize their unique historical, archeological, cultural, geological, biological, or ecological characteristics.
8. **Forest Product Harvests and Other Activities.** Forest product harvests and other management activities are conducted in accordance with the management plan and consider other forest values.

Qualified Forest Program

The Qualified Forest Program (Public Acts 42 and 45 of 2013, as amended) exempts forest owners from paying local millage taxes up to 18 mills in each tax jurisdiction (township). Landowners must have between 20 and 640 acres, a forest management plan, and agree to comply with their forest management plan. Landowners must report harvests to the Michigan Department of Agriculture and Rural Development after they occur. A Forest Stewardship Plan is accepted by the Qualified Forest program. See www.Michigan.gov/QFP for information and enrollment forms. The application deadline is September 1 for tax benefits in the following year.

Commercial Forest Program

The Commercial Forest Program offers a specific property tax of \$1.25 per acre (Parts 511 & 512 of Public Act 451, 1994, as amended). Landowners must have at least 40 acres of forest, a forest management plan, conduct commercial harvests as prescribed in the plan, and allow public foot access for hunting and fishing. Landowners must notify the DNR before they harvest forest products. A Forest Stewardship Plan is accepted by the Commercial Forest program. For more information and enrollment forms, see www.Michigan.gov/CommercialForest. The application deadline is April 1 for tax benefits in the following year.

Financial Assistance Programs

The Natural Resources Conservation Service (NRCS) administers several programs such as the Environmental Quality Incentives Program (EQIP) or Conservation Stewardship Program (CSP) that may provide financial assistance to forest owners to implement “conservation practices” to address “resource concerns” on their land. Landowners must have an approved forest management plan prior to enrolling. Forest Stewardship Plans are accepted by the NRCS when applying for EQIP funding, although they do not require the same level of detail as NRCS conservation activity plans. Work with your NRCS District Conservationist and forester to fill out supplemental “Job Sheets.” See www.mi.nrcs.usda.gov/technical/forestry.html for info.

Some of the recommended activities in this plan have potential for financial assistance. NRCS forestry “conservation practices” include forest trails and landings, stream crossings, riparian forest buffers, stream habitat improvement, forest stand improvement, tree and shrub establishment, brush management, early succession habitat, wetland wildlife habitat, and upland wildlife habitat. NRCS conservation practices address “resource concerns” (environmental problems) like soil erosion, soil quality, water quality degradation, plant productivity, habitat fragmentation, invasive plants, forest health, etc. Contact your local NRCS Service Center to apply for financial assistance (see www.nrcs.usda.gov/wps/portal/nrcs/main/mi/contact/local).

