



FOREST STEWARDSHIP PLAN

**152 Acres in the Northwest 1/4 of Section 29
Sherman Township, Mason County, MI T19N, R16W
Parcel # 013-029-005-00
013-029-006-00
013-029-008-00**



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Prepared For:
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INTRODUCTION

This 152 acre parcel is located in the Northwest 1/4 of section 29, Sherman Township, Mason County, Michigan. The ownership objectives for the 152 acre property are several and are further explained in this forest management plan. These include: Maintaining ranges for recreation, maintaining the forest for wildlife viewing opportunities, managing sustainably for future generations to enjoy, to generate periodic income from the sale of forest products and maintain aesthetics. The owner's primary use of the property include recreation, wildlife viewing, timber investment, and aesthetic value.



This property has 143 acres of solid timberland. This parcel is 94% forested. This forest property is well stocked growing in excess of 20 cubic feet of timber per acre per year which is the standard to be classified as forest land. This plan outlines forest management practices for a 20 year period. This plan will expire at the end of August of 2041, with follow up evaluations taking place every 10 years.

SUMMARY OF CURRENT PROPERTY CONDITIONS

The property is composed of 152 acres in section 29 of Sherman Township, Mason County, parcel numbers 013-029-005-00, 013-029-006-00, and 013-029-008-00. This property is currently being managed for recreation, and for timber investment.

This property is owned by the Fin and Feather Club of Mason County that was established in 1936, with a mission of educating members on proper firearm handling and becoming more proficient when out hunting. The current membership is 900 members, with the club expecting more growth. The property has 9 firearm ranges in total, with a combo of inside and outside firearm ranges. The club has many different activities for its members including programs like hunter's safety, cowboy action, youth silhouette, well-armed women, and more. The league puts on hunter's safety education courses to promote safe handling of firearms and ethical hunting. The league has lessons available for all types of shooters from novice up to advanced. Since the league is located on property that has multiple forest types, archery shooters are able to practice in real world situations in certain areas of the property.

Fin and Feather has multiple firearm ranges, and these ranges collect all the spent lead bullets. The Fin and Feather has the lead extracted/mined off the ranges. By extracting lead from the ranges, they are implementing the best management practices for lead

mitigation. This means that the lead will not be leaching into the soil and groundwater. More information at:

[Best Management Practices for Lead at Outdoor Shooting Ranges | Lead](#)

The ranges in stand two get mowed as needed to keep the grass and brush down. Stand six has had a harvest sometime in the past, and the pine is in decline now. Stand seven has had a harvest 10+ years ago and is in good condition. The property has not had a written forest management plan under the current ownership.

Some suggested activities that can be added to the property include having trails through the stands. This can be a great way to see and enjoy more of nature but will be hard to implement because the property is an active gun range. Another educational piece that can be done is having signs up near trees that are easy to access with a description of what species they are, estimated age, management needed to thrive, lifespan and any other interesting facts. These areas are a great way to get people interested in the outdoors without having to give too much information. Another educational piece is having a few signs in all eight stands describing what the management objectives are, and when any harvests are likely to occur. This should help with members understanding that active forestry will occur and why it is in the forests best interest.

CURRENT STAND CONDITIONS AND MANAGEMENT

As the stand map (Figure 2) shows there are two stand types which were identified on the property. They are: (Stand 1) Aspen A3, Oak O4, White pine W4, W7 (Stand 2) Local use I (Stand 3.A, 3.B) Aspen A9 (Stand 4) Marsh N (Stand 5) Oak O5 Aspen A6 (Stand 6) Upland Mixed Conifers MC8 (Stand 7) Northern hardwoods M6,7 and (stand 8) Water.

Stand 1: Aspen A3, Oak O4, White pine W4,7

Stand one is a 31 acre timber component of the property composed primarily of Red oak poles, scattered red maple poles, scattered white pine poles with a few overstory sawlog sized white pine, and aspen seedlings. Overall, this stand is a mixture of seedling aspen, pole sized red oak, red maple, white pine, and scattered overstory white pine. The stand is a mixture of high ground that is well drained, the oak, aspen, white pine, and maple, which are the dominant species in this unit, thrive on these nutrient rich moderate to well drained sites. Small pockets of poorly drained low ground soils are scattered throughout the stand. The basal area for stand one is 100 square foot per acre, which is a good basal area for lowland hardwoods. *[Note: The basal area of a tree is the cross sectional area of the trunk at 4.5 feet. The basal area of a stand is the sum of each individual tree's basal area.]* The aesthetics of this stand is above average for a Aspen, Oak and White pine stand. The Diversity and variety of age classes makes this a great looking stand. This stand has not had any active

management in years and should be left to grow for the duration of the plan. Re-evaluation should occur at the end of the plan.

This stand as a whole is very important to wildlife such as white tailed deer and turkey. The oaks produce acorns which are essential in the diets of these upland game species. Openings created by a selective thinning and release harvest are advised; these openings will facilitate regeneration of seedlings and increased growth on pole timber. Leaving treetops high will provide cover for white tailed deer and upland game species and protection for new seedlings.

The desired future condition for this stand is the continuation of aspen, oak, red maple, and white pine. The stand should be re-evaluated in 15-20 years.

This stand is able to educate campers on the importance of managing a forest through selective and single tree harvests, so the continuation of the overall forest can occur. These types of forests are long lived and require less impact when harvesting compared to stand two. Selective and single tree harvests allow the forester to pick specific trees to promote growth of the residual trees. The white pine in this stand allows for education on what species used to be prevalent throughout Michigan before the logging boom from 1850-1900 cleared almost all the old growth, leaving stumps throughout the state. This forest type can be considered the most widespread forest type, which means a wide variety of species are present depending on where the forest is located in the state. More information can be found at:

[Landowner's Guide: Mesic Hardwoods](#)

[Landowner's Guide: Dry Mesic Conifers](#)

Stand 2: Gun ranges and Clubhouse (Local Use I)

Stand two is a 9.27 acre stand that comprises the club house and shooting ranges. The ranges are scattered throughout the property in four different areas. The clubhouse is located in one of the openings.

These openings provide a contrast between the forested area and openings creating edges. Many species such as turkeys and whitetail deer desire edges for their habitat, feeding and for travel purposes. The grass and other forage planted here provide food for these animals, primarily white tailed deer. Just as in the forest it is important on this ground to avoid soil erosion as much as possible. By maintaining grass as much as possible erosion can be mitigated. Maintaining the opening and keeping the opening from filling in with woody vegetation will ensure that the opening stays a component of the property.



The desired future condition for this stand is the continuation of grass openings and minimizing encroachment from trees and shrubs.

Stand 3: Aspen A9

Stand three has four separate areas that total 50.2 acres. The stand is composed of mainly saw log aspen with red maple, red oak, and white pine scattered throughout the stand as well in low numbers. These trees grow well on well drained upland soils which is the primary soil component of this property. This stand is broken up into 3A and 3B in terms of harvest schedule. The basal area for stand three is between 120 square feet per acre, depending on the specific area, which is a high basal area for aspen. *[Note: The basal area of a tree is the cross-sectional area of the trunk at 4.5 feet. The basal area of a stand is the sum of each individual tree's basal area.]* The aesthetics of this stand is average for aspen stands but will degrade as the aspen gets older.

The desired future condition for this stand is the regeneration of aspen and scattered oaks and maples along the edges. Stand 3A should be harvested in the next 5 years, and 3B should be harvested in 5-10 years. The harvests will promote sprouting from stumps, roots, and seeds of the harvested trees. The aspen cut in stand 3 will incorporate harvesting a portion of hardwood trees surrounding the existing aspen clone and within the aspen clone. This will allow the harvest area to be large enough to receive enough sunlight to stimulate good sprouting.

After all harvests, there should be a follow-up evaluation one-year post harvest. This evaluation should monitor the rate and success of natural seedling and regeneration. If there is good recruitment of seedlings that have grown out of the reach of browsing animals, no further monitoring is needed. I suggest managing this stand for sustainable timber production that is compatible with maintaining biodiversity, recreation, and aesthetics. The desired future condition is the regeneration of an aspen forest that protects soil and water resources. After this initial harvest new seedlings should be monitored after one growing season to see the progress. There should be good aspen and oak seedling recruitment after this first growing season. Oak seedlings should be several feet in height and aspen shoots should exceed 3 feet in height. By clearcutting, the aspen will regenerate and create great food and cover for wildlife.

Since aspen is so beneficial to a wide variety of wildlife, managing for the continuation of aspen is needed to maintain the wildlife. More information can be had at: https://www.michigandnr.com/publications/pdfs/huntingwildlifehabitat/Landowners_Guide/Habitat_Mgmt/Forest/Aspen_And_Birch.htm

Stand 4: Marsh N

Stand four is a 19.11 acre swamp, with vernal ponds that can dry up in dry times. The portion of the stand in the southwestern corner has a small creek running through. The stand is composed of scattered white pine seedlings, red maple poles, leatherleaf, tag alder, and swamp grass. The ground, especially near the creek, is very mucky. No basal area was recorded for this area due to the species present. A riparian buffer is needed when any harvesting occurs in stands one, three A, three B, five, six, and seven.

The desired future condition for this stand is the continuation of a marsh with the creek running through the southern edge. This stand should be maintained as a buffer for the creek. I suggest managing this stand as a marsh with no active management.

This stand is able to educate members on the importance of keeping marshes to maintain hydrology near bodies of water. On average marshes produce 3 times as more biomass when compared to lakes, grassland and farms. Since marshes filter water before it enters or exits bodies of water, sedimentation is slowed down. More information can be found at:

[Landowner's Guide: Marshes.](#)

Stand 5: Oak O5, Aspen A6

Stand five is a 6.7 acre stand composed of oak and aspen pole timber. The oak and aspen poles are well stocked and are on a combination of well drained and mucky soils. The majority of trees growing in this stand are pole size aspen and oaks. The basal area for stand five is 90 square feet per acre, which is good for an oak & aspen pine stand. *[Note: The basal area of a tree is the cross-sectional area of the trunk at 4.5 feet. The basal area of a stand is the sum of each individual tree's basal area.]* The aesthetics of this stand is average for an oak & aspen forest but will decrease as the oaks mature.

The desired future condition for this stand is the continuation of an oak and aspen forest. The oak and aspen are regenerating well. and a harvest should take place 10-15 years from now along with stand 3B. With this cut many of the pole size oaks will be left to grow and mature. The remaining oaks will also produce hard mast which will be good forage for upland game while fostering recruitment of young oak seedlings in the stand. In areas where the oak poles and logs are too thick, they will be thinned. Leaving tops and logging slash will provide shelter for young seedlings and create wildlife habitat as well. Tops will provide valuable wildlife cover until fully decomposed.

The soil structure is quite sandy and gravelly here allowing these more drought tolerant species to thrive, as well as wetter and poorly drained in small pockets. The oak trees in this unit provide hard mast in the form of acorns, which provide food for upland game species which call this timber type home. Thinning around seed trees and leaving trees with holes and hollow trunks will ensure that forage and shelter for cavity dwelling species will remain. One year post harvest assessment is encouraged to monitor aspen seedlings and see if they are surviving the high deer browse, which is likely to pose a threat to the success of the new aspen forest.

This stand is able to educate members on the diversity of oak and aspen and how they are important for wildlife, as well as the importance of managing a forest based on the species that are present. Not everything in nature is pretty and some feel that clearcuts are ugly and therefore should not be used as a management tool since they feel the look is ugly. This could be further from the truth depending on the species that are present. Since aspen are some of the first species to grow after a disturbance, they are short lived and sun loving. In order for the continuation of aspen on a site, some sort of disturbance has to happen. Whether this is a natural disturbance such as fire, flooding, avalanches in mountains or artificial disturbances such as clearcutting, it is just another part of nature. Since aspen is so beneficial to a wide variety of wildlife, managing for the continuation of aspen is needed to maintain the wildlife. The oaks should be managed for selection harvests in the distant future to promote growth of residual trees. More information can be had at:

https://www.michigandnr.com/publications/pdfs/huntingwildlifehabitat/Landowners_Guide/Habitat_Mgmt/Forest/Aspen_And_Birch.htm
[Landowner's Guide: Dry Hardwoods \(Oak-Hickory\)](#)

Stand 6: Upland Mixed Conifer MC6

Stand six has 6 different areas that total 12.7 acres. It is a mixed upland conifer stand composed of mainly red pine with scattered white pine, scotch pine, and a few jack pine. The stand has had a previous harvest, but the red pine is showing signs of decline. The basal area for stand six is 100 square feet per acre, which is a good basal area for a mixed upland conifer stand. *[Note: The basal area of a tree is the cross-sectional area of the trunk at 4.5 feet. The basal area of a stand is the sum of each individual tree's basal area.]* The aesthetics of this stand is average for an upland mixed conifer stand.

Red, jack, and scotch pine do not naturally seed well in the absence of fire, but white pines can naturally seed. Since white pines are present in the stand, regeneration after a harvest or disturbance is likely. Fire provides a mineral seed bed which red, jack, and scotch pine seeds require for germination. The presence of hardwood species such as sugar maple, red maple, red oak, cherry, and beech in other areas of the property; will out compete the red, jack, and scotch pine seedlings on this higher nutrient site.

This stand should have a harvest in the next five years, along with stand 3A, to remove the declining red pine and any other poorly formed species, depending on the league's objectives. The hardwoods will grow faster and shade out any red, jack, and scotch pines that do establish after the harvest. Natural seeding is expected to be the means of regeneration of hardwood in this stand. The trees adjacent which are hardwood trees will provide the seed source for the new forest to grow. Many species such as turkeys and whitetail deer desire edges for their habitat for feeding and travel purposes.

The desired future condition for this stand is the continuation of upland mixed conifers with hardwoods slowly taking over into the future. Leaving tops and logging slash will

provide shelter for young seedlings and create wildlife habitat as well. Tops will provide valuable wildlife cover and keep them on the property. I suggest managing this stand for sustainable timber production that is compatible with maintaining biodiversity, recreation, and aesthetics.

This stand is able to educate campers on the importance of proper management for a variety of species. When red, jack and scots pines are planted, they create a monoculture that does not have much habitat for wildlife, except for thermal cover. With the hardwoods growing in the understory, diversity will continue to improve into the future. More information can be found at:

[Red Pine](#)

[Landowner's Guide: Dry Conifers \(Jack & Red Pine\)](#)

[Landowner's Guide: Dry Mesic Conifers](#)

Stand 7: Northern Hardwoods M6, 7

Stand seven has 3 areas totaling 23 acres of northern hardwood consisting of mature sugar maple, white pine, red maple, cherry, red oak, and beech. The basal area for stand seven is 80 square feet per acre, which is a good basal area for northern hardwoods and white pine. *[Note: The basal area of a tree is the cross-sectional area of the trunk at 4.5 feet. The basal area of a stand is the sum of each individual tree's basal area.]* The aesthetics of this stand is above average for northern hardwoods. The continuing growth will increase diversity to make this a great looking stand.

The desired future condition for this stand is the continuation of northern hardwoods. This stand was harvested 10+ years ago and should be harvested in the next 5-7 years to maintain optimal growth, and to open up the understory and allow light to reach the forest floor. Leaving tops and logging slash will provide shelter for young seedlings and create wildlife habitat as well. Tops will provide valuable wildlife cover and keep them on the property.

After all harvests, there should be a follow up evaluation one year post harvest. This evaluation should monitor the rate and success of natural seedling and regeneration. If there is good recruitment of seedlings that have grown out of the reach of browsing animals no further monitoring is needed. If herbivory is the main cause of poor recruitment, tree shelters are suggested to be used around planted seedlings or natural seedlings that need protection. If planting is deemed necessary, herbicide can be used to combat competing vegetation and tree shelters can be used for protection from browsing animals. These treatments are only needed if the seedlings are struggling and that will be unlikely. I suggest managing this stand for sustainable timber production that is compatible with maintaining biodiversity, recreation, and aesthetics. The desired future condition is the continuation of a northern hardwood forest that protects soil and water resources.

This stand is able to educate campers on the importance of managing a forest through selective and single tree harvests, so the continuation of the overall forest can occur.

These types of forests are long lived and require less impact when harvesting compared to stand two. Selective and single tree harvests allow the forester to pick specific trees to promote growth of the residual trees. This forest type can be considered the most widespread forest type, which means a wide variety of species are present depending on where the forest is located in the state. More information can be found at: [Landowner's Guide: Mesic Hardwoods](#)

Stand 8: Water

Stand eight is a creek with running water during most times of the year along the southwestern corner of the property. Species present include willow, red maple and grasses along with some standing, dead trees over open water. The area receives substantial use by waterfowl.

Allowing a buffer around this area is a good idea when conducting a timber harvest in adjacent areas. Buffers allow these areas to be less disturbed and prevent erosion of the soils around them which tend to allow creeks to be less disturbed, with surrounding areas draining into this unit utilization of a buffer will be important. Lite selective harvesting within the buffer is permitted, however due to the adjacent stand being a marsh harvesting is not advised. No active management efforts are recommended for this unit during the next twenty year period.

This stand is able to educate members on the importance of creeks and their significance as wildlife habitat of all varieties. More information can be found at: [Landowner's Guide: Streams and Rivers](#)

WILDLIFE HABITAT

Each stand plays its own role in achieving land ownership objectives. Some stands should be managed for timber and financial returns; some stands should be managed for wildlife habitat and aesthetics. Some areas should be left alone, as in stand four and stand eight along the creek. This parcel of land offers multiple management opportunities, both commercial and noncommercial, because of the variety of cover types.

Stand one is a mix of aspen and red oak seedlings with scattered red maple, red oak, and white pine poles and scattered white pine sawlog trees. The aspen and oak are great food sources for wildlife with the mast they produce. The white pine creates some thermal cover in the early pole sized stage. These trees are important for production of seeds and hard mast nut production. Leaving good mast trees post harvest will provide forage for deer and turkeys primarily. Thinning around oaks will reduce competition for nutrients thus allowing the tree to produce a better nut crop. The larger "wolf trees" have and will provide good roosting opportunities for turkeys, owls, and birds of prey. Also, there are hollow trees scattered about the property which can be retained and used as den trees for squirrels, bats, raccoons, owls, and other species which require these

hollow cavities. Retention of these trees will be important.

Stand two is where the ranges and clubhouse buildings are located. The grass openings are good for a variety of wildlife that like to use the edges for browsing. Openings and edges present in stand two have large insect populations that are critical to young turkeys and other animals.

Stand three has four different aspen pockets throughout the property. The aspen in stand three will provide less wildlife cover as the mature. The clear cutting that will occur in 3A the next five years will return young vertical cover to the property and create security cover. Then, 3B will be harvested in 5-10 years to create more age diversity. The aspen within this stand will be clearcut and any oaks present will be left to grow. These trees are important for production of seeds and hard mast nut production. Leaving good mast trees post-harvest will provide forage for deer and turkeys primarily. Thinning around oaks will reduce competition for nutrients thus allowing the tree to produce a better nut crop. The harvest that will eventually occur in stand one will add more diversity and ensure that young vertical cover will continue to be present on the property. The result of this scheduled aspen harvest will be that the aspen clones will flourish post clear cut and expand with more available sunlight and nutrients. By keeping different portions of stand three in different age classes, it will create different levels of cover which upland game such as woodcock, ruffed grouse, turkey, and white tailed deer require. It is difficult for humans to navigate new aspen stands; therefore, wildlife species find needed protection from predators here. The aspen provides a great food source for grouse, and they will eat the buds, twigs and catkins of aspen year-round. Grouse and woodcock need different age classes of aspen habitat to remain in an area as they utilize different age classes during different times of their lifecycle. More information can be found at: [Grouse and Woodcock Habitat - RGS](#) Non-game animals like songbirds, raptors, reptiles, amphibians, and invertebrates also utilize these areas for cover.

Stand four is a marsh area with a creek running through the southern area of the stand. The marsh provides decent habitat value to game animals in their current stage of development. This area protects and filters runoff before it enters the creek. These areas also provide habitat for many reptiles, amphibians, and invertebrates on the property especially in the spring and fall of the year when there are elevated water levels. Pooling water in areas like this are good habitat for some reptile and amphibian species such as salamanders, frogs, and turtles. Seasonally wet areas such as this tend to be wet in spring and fall months and are moderately dry during the summer months. Also, marshes such as this are home to birds such as ducks, herons, geese, and other waterfowl. The marsh can be utilized by waterfowl at different times of the year for nesting grounds. Muskrats, turtles, small fish, salamanders, and other aquatic creatures depend on these areas for their survival. This marsh also provides a water source for upland game, birds and other woodland creatures. A buffer of 50 feet on all sides of stand four should be maintained when harvesting in stands one, two, three, five, six, and seven. This will mitigate erosion and soil degradation in and near stand five.

Stand five is an aspen and oak pole stand. The aspen in stand one will provide less wildlife cover as it matures. Clear cutting the aspen pockets in stand five in 5-10 years along with 3B will create this security cover. Clear cutting the aspen in stands one and three will return young vertical cover to the property. Once clearcut, the pole hardwoods will be released, and will grow into a larger component. The result of these scheduled aspen harvests will be that the aspen clones will flourish post clear cut and expand with more available sunlight and nutrients. By breaking the aspen pockets of the property into different harvest units, different age classes will be created offering different levels of cover which upland game such as woodcock, ruffed grouse, turkey, and white tailed deer require. It is difficult for humans to navigate new aspen stands; therefore, wildlife species find needed protection from predators here. Non-game animals like songbirds, raptors, reptiles, amphibians, and invertebrates also utilize these areas for cover.

Stand six has five different areas that are red, white, jack and scots pine. The maturity of this stand does not promote much wildlife habitat, with the exception of the white pine creating thermal cover. When this stand is harvested along with stand 3A and 3B, portions will regenerate with hardwood seedlings. These hardwood seedlings are a good food source and cover for wildlife. Being that this stand is still well stocked with red pine and scattered white pine, they will provide good thermal cover for wildlife during the winter months. By clearcutting the red pine, a new age class of hardwoods has been created with different levels of cover which upland game such as woodcock, ruffed grouse, turkey, and white tailed deer require. It is difficult for humans to navigate thinning when tops are left in the stands; therefore, wildlife species find needed protection from predators here. Non-game animals like songbirds, raptors, reptiles, amphibians, and invertebrates also utilize these areas for cover.

Stand seven has three different areas that are composed of mature sugar maple, red oak, red maple, white pine, cherry, and beech. A selective harvest should occur in the next 5-7 years. By removing some of the white pines when the stand is harvested, hardwoods will be able to regenerate. These trees are important for production of seeds and hard mast nut production. Leaving good mast trees post harvest will provide forage for deer and turkeys primarily. Thinning around oaks will reduce competition for nutrients thus allowing the tree to produce a better nut crop. The larger "wolf trees" have and will provide good roosting opportunities for turkeys, owls, and birds of prey. Also, there are hollow trees scattered about the property which can be retained and used as den trees for squirrels, bats, raccoons, owls, and other species which require these hollow cavities. Retention of these trees will be important. The white pine in this stand provides thermal cover for game and non-game animals during the winter months. It is important that this aspect of the stand be maintained.

Stand eight is the creek bottom that runs through stand four. The water that runs through the creek will be utilized by wildlife, including waterfowl, deer, turkeys, amphibians, reptiles and more. Muskrats, turtles, small fish, salamanders, and other aquatic creatures depend on these areas for their survival.

SOILS

11 different soil types were identified on this 152 acre property. They include, Covert sand 0-6 percent slopes, Epworth Fine sand 0-6, 6-12 percent slopes, Grattan sand 0-6 percent slopes, Kaleva sand 0-6 percent slopes, Kerston-Carlisle-Glendorra complex, Kinross mucky fine sand, Loxley and Dawson, Pipestone fine sand 0-4 percent slopes, Pipestone-Saugatuck sands 0-4 percent slopes, Sickles loamy sand, Wallace fine sand 3-15 percent slopes. (Figure 1) (Table 1).

Carlisle: The Carlisle series consists of very deep, very poorly drained soils formed in woody and herbaceous organic materials in depressions within lake plains, outwash plains, ground moraines, flood plains and moraines. Slope ranges from 0 to 2 percent. Major tree species include American elm, white ash, red maple, willow, tamarack, quaking aspen, and alder. The site index for red maple is 56 and the expected annual growth rate is 29 ft³/acre. Carlisle soils are poorly suited for harvesting equipment during wet times of the year due to low soil strength.

Covert: The Covert series consists of very deep, moderately well drained soils formed in sandy drift on ground moraines, outwash plains, lake plains, and dunes. Slope ranges from 0 to 8 percent. About 40 percent of this soil is under cultivation to small grain and hay. The remainder is idle cropland, permanent pasture, or forest. The forest vegetation consists of quaking aspen, white oak, northern red oak, wild cherry, eastern white pine, and jack pine. The site index for Northern red oak is 67 and the expected annual growth rate is 57ft³/acre. The Covert soils are moderately suited for large equipment.

Dawson: The Dawson series consists of very deep, very poorly drained soils formed in herbaceous organic material 16 to 51 inches thick overlying sandy deposits in depressions on outwash plains, lake plains, ground moraines, end moraines and floodplains. Permeability is moderately slow to moderately rapid in the organic material and rapid in the sandy material. Slopes range from 0 to 2 percent. Dawson soils are in depressions within outwash plains and lake plains, ground moraines and end moraines. In some places, Dawson soils are on flood plains. Slope gradients range from 0 to 2 percent. The uplands surrounding these soils are commonly acid sands. Very little commercial use is made of these soils, because of the extreme acidity, shallowness of the organic deposit, and the high water table. Tree vegetation is sparse with black spruce and tamarack comprising the major species. Ground cover is composed of bog rosemary, cranberries, laurel, leatherleaf, sphagnum mosses, and blueberries. No site index or annual growth is available for Dawson soil types. Dawson soils are poorly suited for harvesting equipment during wet times of the year because of low strength and wetness.

Epworth: The Epworth series consists of very deep, well drained and moderately well drained soils formed in fine sands on lake plains, beach ridges, outwash plains, and moraines. Slope ranges from 0 to 15 percent. Epworth soils are on lake plains, beach ridges, outwash plains, and moraines. Slope ranges from 0 to 15 percent. The Epworth soils formed in fine sand. Well drained and moderately well drained. Potential for

surface runoff is negligible or very low. Most areas are forested, but a few areas are used for specialty crops. Overstory vegetation is dominantly northern red oak, white oak, and red maple. The site index for Northern red oak is 67 and the expected annual growth rate is 61ft³/acre. The Epworth soils are well suited for large equipment.

Glendora: The Glendora series consists of very deep, poorly drained or very poorly drained soils formed in sandy alluvium. These soils are on nearly level areas or slight depressions, including old drainage ways, and on flood plains in river valleys. Slope ranges from 0 to 2 percent. Most areas are pastured or forestland. Some areas are cultivated. Corn and hay are the principal crops. Native vegetation is American elm, white ash, swamp white oak, and quaking aspen. The site index for Red maple is 63 and the expected annual growth is 43 ft³/acre. Glendora soils are poorly suited for harvesting equipment during wet times of the year due to low soil strength.

Grattan: The Grattan series consists of very deep, excessively drained soils formed in sandy drift on lake plains, outwash plains, moraines, and beach ridges. Slope ranges from 0 to 70 percent. Grattan soils are on outwash plains, lake plains, moraines, or beach ridges. Slope ranges from 0 to 70 percent. Grattan soils formed in sandy drift. Excessively drained. Potential for surface runoff is negligible to medium depending on the slope. Saturated hydraulic conductivity is high or very high. Much of the Grattan soil was cleared at one time and used for pasture or cropland. Much is idle or in pine plantations. Specialty crops are grown on intensively managed areas. Native vegetation is dominantly quaking aspen, eastern white pine, red maple, white oak, northern red oak, and black oaks. The site index for Northern red oak is 55 and expected annual growth is 39 ft³/acre. The Grattan soils are well drained, and well suited for harvesting equipment.

Kaleva: The Kaleva series consists of very deep, excessively drained soils on outwash plains, lake plains, and moraines. These soils are formed in sandy deposits. Slope ranges from 0 to 50 percent. Kaleva soils are on outwash plains, lake plains, and moraines. Slope ranges from 0 to 50 percent. These soils formed in sandy deposits. Most areas are forested or are idle. Some areas are used for orchard crops. The site index for Sugar maple is 64 and expected annual growth is 43 ft³/acre. The Kaleva soils are well drained, and well suited for harvesting equipment.

Kerston: The Kerston series consists of very deep, very poorly drained soils that formed in 41 to 76 cm (16 to 30 inches) of organic materials overlying alternating layers of organic and mineral materials on flood plains and glacial drainage ways. Slope ranges from 0 to 2 percent. The greater part of this soil is in native vegetation, which consists of marsh grasses, sedges, reeds, and shrubs. Some areas have a poor quality lowland hardwood forest including American elm, white ash, cottonwood, red and silver maple. Other areas are drained and planted to high value crops such as celery, carrots, onions, lettuce, and mint. The site index for Red maple is 51 and the expected annual growth rate is 29ft³/acre. Kerston soils are poorly suited for harvesting equipment during wet times of the year due to low soil strength.

Kinross: The Kinross series consists of very deep, poorly drained and very poorly drained soils formed in glaciofluvial material on outwash plains, stream terraces, lake plains, kame, disintegration and ground moraines. Permeability is rapid. Slopes range from 0 to 3 percent. Kinross soils are on outwash plains, lake plains, stream terraces, kame, disintegration and ground moraines. Slope gradients range from 0 to 3 percent. Most of this soil is in woodland or brush. Black spruce, tamarack, northern white cedar, balsam fir, red maple, and quaking aspen are the principal tree species. Ground cover includes water tolerant grasses and sedges, leatherleaf, sphagnum, and bog rosemary. The site index for Quaking aspen is 45 and the expected annual growth rate is 29ft³/acre. Kinross soils are poorly suited for harvesting equipment during wet times of the year due to low soil strength.

Loxley: The Loxley series consists of very deep, very poorly drained soils formed in herbaceous organic deposits more than 51 inches thick in depressions on moraines, lake plains and outwash plains. These soils have moderately slow to moderately rapid permeability. Slopes range from 0 to 2 percent. In some places they are in depressions on flood plains. The representative depth to wet soil moisture status is at the surface to 1 foot below the surface at some time throughout the year. The representative depth of ponding is from 0 to 1.0 foot at some time throughout the year. Surface runoff is negligible to medium. Very little intensive use is made of these soils because of excess wetness, extreme acidity, and frost hazard. Soil areas usually lack suitable drainage outlets. Ground cover consists principally of blueberry, leatherleaf, sphagnum moss, and wintergreen. Trees are limited to a few scattered black spruce, jack pine, quaking aspen, and tamarack. The site index for black spruce is 15 and the expected annual growth rate is 29ft³/acre. Loxley soils are poorly suited for harvesting equipment during wet times of the year due to low soil strength and wetness.

Pipestone: The Pipestone series consists of very deep, somewhat poorly drained soils formed in sandy outwash on outwash plains, lake plains, beach ridges, and water-worked till plains. Slope ranges from 0 to 8 percent. Somewhat poorly drained. The water table fluctuates from near the surface during prolonged wet periods to depths greater than 122 cm (4 feet) in dry seasons. Depth to the top of a seasonal high-water table ranges from 15 to 46 cm (0.5 to 1.5 feet) between October and June in normal years. Potential for surface runoff is negligible or very low. Saturated hydraulic conductivity is high or very high. Permeability is rapid. A large part is or has been cultivated. Some areas are in permanent pasture. Special crops such as blueberries, cucumbers, and melons are important crops on this soil. Many areas are in various stages of reforestation. Natural forests are American basswood, eastern cottonwood, northern red oak, bitternut hickory, white ash, swamp white oak, and red maple. The Site index for Red maple is 65 and the expected annual growth is 43 ft³/acre. The Pipestone soils are poorly drained and are poorly suited for harvesting equipment during wet times of the year.

Saugatuck: The Saugatuck series consists of very deep, somewhat poorly drained soils with cemented subsoil. These soils formed in sandy glaciofluvial deposits on lake plains, till plains, and outwash plains. Slope ranges from 0 to 6 percent. Saugatuck soils

are on outwash plains, lake plains, and till plains. Slope ranges from 0 to 6 percent. The Saugatuck soils formed in sandy glaciofluvial deposits. Mostly second growth forest with a small acreage in pasture, blueberries, vegetables, and general crops. Principal tree species included aspen, white pine, black spruce, red maple, northern white cedar, and paper birch. The site index for Red maple is 45 and the expected annual growth rate is 29ft³/acre. Saugatuck soils are poorly suited for harvesting equipment during wet times of the year due to low soil strength.

Wallace: The Wallace series consists of very deep, well drained soils formed in sandy deposits on dunes, lake plains and outwash plains. Permeability is moderate or moderately rapid in the ortstein layer and rapid through the remainder of the pedon. Slopes range from 0 to 60 percent. The thickness of the solum ranges from 20 to 60 inches. Gravel content ranges from 0 to 5 percent by volume throughout the pedon. Wallace soils are on dunes, lake plains and outwash plains. Slopes range from 0 to 60 percent. Well drained. Surface runoff is negligible to low. Permeability is moderate or moderately rapid in the ortstein layer and rapid throughout the remainder of the soil. Wallace soils are almost entirely in second growth woodland and support stands of sugar maple and red maple, red pine and eastern white pine, eastern hemlock, balsam fir, quaking aspen, and white birch. The site index for Eastern white pine is 52 and the expected annual growth rate is 96 ft³/acre. Wallace soils are well suited for harvesting equipment.

Sand soils comprise the majority of the soil structure of the whole property making the soil structure relatively uniform. The sandy soils are associated with the upland tree species that are found on the property, these soils allow upland trees such as white and black oak, red maple, white pine, and aspen to grow. The sandy soil allows these species to thrive due to the drier climate and drainage capability caused by the sand. Because sand has well drained characteristics this property can be harvested in almost any season of the year. This is with the exception of an unusually wet spring, in which case the ground should be allowed to drain for a day or two allowing for proper drainage for heavy harvesting equipment to later access.

The muck and mucky sand soils are wet poorly drained soils and as expected are associated with the marsh and creek bottom. This soil allows trees which like wet soil and can tolerate wet soils to thrive. These soils are poorly drained and allow for standing water much of the year.

HYDROLOGY

There are a few unique wet low ground areas on the property, they are stand four and eight where the water will drain into at different times of the year, particularly in the spring and fall months. This low ground will have standing water during all times of the year. When several droughty years occur in a row there will be less water standing in these areas. During times of normal climatic cycles, the creek and low areas will hold standing water. In the event of a logging operation near these areas, they should be

treated with care and consideration. Logging can occur near this area however; buffers should be established. A well-timed harvest will negate any issues of concern from logging near these sensitive areas.

THREATENED AND ENDANGERED SPECIES

During the survey of the property no threatened or endangered species were observed. The Michigan Natural Features Inventory (MNFI) was used to confirm the property has no known threatened or endangered species at this time.

SPECIAL SITES

There are no known special sites on the property. The State Historic Preservation Office database does not show the presence of any historical sites in this section of the Township (www.Michigan.gov/Archaeology). 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, or required habitat for threatened or endangered species statewide).

INVASIVE SPECIES

Autumn Olive is the only invasive species present at this time. The property should be evaluated yearly to ensure that invasives don't show up on the property.

Autumn olive is extremely aggressive, and the seeds are able to be dispersed widely by birds and mammals. Autumn olive is very vigorous and able to displace native plants, degrading the landscape. Autumn olive is very hard to control, due to the cut stumps vigorously re-sprouting. More information can be obtained at:

[Invasive Species - Autumn Olive](#)

FOREST HEALTH

I did not observe any major forest health issues (insects, disease, invasive plants) on this property at this time. Beech bark disease is not present on the property, but is likely nearby. The ash in the low ground is all dead, due to the Emerald ash borer.

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. The 1972 federal Clean Water Act requires that states develop BMPs to protect water quality in forests. Michigan's BMPs are published in the "Michigan Forestry Best Management Practices for Soil and Water Quality" which is online at www.Michigan.gov/Forestry. BMPs include proper location and construction of logging roads, the use of riparian management zones (RMZs), 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. www.Michigan.gov/Forestry

STAND ACTIVITIES

Stand one:

Stand one is a 31 acre timber component of the property composed primarily of Red oak poles, scattered red maple poles, scattered white pine poles with a few overstory sawlog sized white pine, and aspen seedlings. Overall this stand is a mixture of seedling aspen, pole sized red oak, red maple, white pine and scattered overstory white pine. The stand is a mixture of high ground that is well drained, the oak, aspen, white pine and maple which are the dominant species in this unit thrive on these nutrient rich moderate to well drained sites. Small pockets of poorly drained low ground soils are scattered throughout the stand.

Timber Harvest Objectives: This stand has not had any active management in years and should be left to grow for the duration of the plan. Reevaluation should occur at the end of the plan.

Stand two:

Stand two is a 9.27 acre stand that comprises the club house and shooting ranges. The ranges are scattered throughout the property in four different areas. The clubhouse is located in one of the openings. The ranges have the shot lead mined periodically. This allows the lead to be removed from the stand, and not allowing it to leach into the soils and groundwater. No forest management will occur in this stand.

The desired future condition for this stand is the continuation of grass openings and minimizing encroachment from trees and shrubs.

Stand three:

Stand three is composed of two aspen stands throughout the property that area in need of harvesting within the next ten years. Stand 3A should be harvested in the next five years, and stand 3B in ten years along with stands 5 & 6. These aspen stands are on high ground sites which are moderately well drained soils that allow aspen and other hardwood species to be dominant and thrive on these nutrient rich moderate to well drained sites.

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. The harvest in stand three will consist of removing the mature aspen, as well as many poorly formed defective and low quality trees so that the better quality trees can grow. This will allow the aspen and oaks to regenerate for the future. As foresters, our primary concern is keeping quality trees in your forest and not just selling most of your 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. Finally, a timber sale should also seek to optimize (but not necessarily maximize) the profits for the landowner in keeping with the above objectives. In this part of the state pulpwood thinning is used as the best management tool for regenerating aspen. Conducting a pulpwood harvest would help release the residual trees as a part of a harvest operation. A pulpwood harvest would take small poorly formed and undesirable species out of the forest and allow the best quality residual trees to be released. Monitoring the aspen cuts the first year after harvest and every 5 years after for health is recommended to assure that the new aspen shoots are growing well post-harvest. These aspen clearcuts will promote vigorous sprouting from the roots of the harvested trees.

Timber Harvest Method: Foresters use two categories of timber harvest methods – even age 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 age 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 age 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. I recommend using even aged methods (clearcut) for stands three A & B to create more diversity and species composition of the forest.

Timber Sale Timing: Timber harvests should be conducted when the soil is frozen or dry. A fall or winter harvest will reduce the exposure of wounded trees to insects (bark

beetles) or disease (oak wilt). Avoid a spring harvest when possible to minimize rutting which damages soil and the roots of the residual trees. Clearcut harvests intervals are species dependent, with aspen usually being a 40-50 year rotation. Stand 3A will be harvested on its own, and 3B will be harvested along with stands 5 & 6. Stand 3A should be harvested between 2021-26 depending on market and site conditions, and stand 3B should be harvested between 2029-2034 depending on market and site conditions.

Stand Four:

Stand four is a marshy area with a small creek running along the southern edge of the property. This unit has dead ash, red maple poles, white pine seedlings, tag alder along with many wet lowland species. The stand has extremely wet soils, so follow Best Management Practices (BMPs) to protect soil and water quality. Maintain a Riparian Management Zone (RMZ) of 50 feet around the creek. Keep soil disturbance to a minimum and avoid building roads in the RMZ when possible. The harvests in stands one, three, five, six and seven should be conducted when soils are dry or frozen. This stand should be protected to reduce erosion and mitigate any impacts from other stands.

Stand five:

Stand five consists of oak and aspen poles that are well stocked. The soils are a combination of well drained and mucky soils. The majority of trees growing in the stand are pole size aspen and oaks.

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.

The harvest in Stand five will consist of removing the mature aspen, as well as many poorly formed defective and low quality trees so that the better quality trees can grow. This will allow the aspen and oaks to regenerate for the future. As Foresters, our primary concern is keeping quality trees in your forest and not just selling most of your 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. Finally, a timber sale should also seek to optimize (but not necessarily maximize) the profits for the landowner in keeping with the above objectives. In this part of the state pulpwood thinning is used as the best management tool for regenerating aspen. Conducting a pulpwood harvest would help release the residual trees as a part of a harvest operation. A pulpwood harvest would take small poorly formed and undesirable species out of the forest and allow the best quality residual trees to be released. Monitoring the aspen cuts the first year after harvest and every 5 years after for health is recommended to assure that the new aspen shoots are growing well post-harvest. These aspen clearcuts will promote vigorous sprouting from the roots of the harvested trees.

Timber Harvest Method: Foresters use two categories of timber harvest methods – even age 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 age 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 age 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. I recommend using even aged methods (clearcut) for Stand five to create more diversity and species composition of the forest.

Timber Sale Timing: Timber harvests should be conducted when the soil is frozen or dry. A fall or winter harvest will reduce the exposure of wounded trees to insects (bark beetles) or disease (oak wilt). Avoid a spring harvest when possible, to minimize rutting which damages soil and the roots of the residual trees. Clearcut harvest intervals are species dependent, with aspen usually being a 40-50 year rotation. Stand five should be harvested with stand 3B & 6. Stand 5 should be harvested between 2029-2034 depending on market and site conditions.

Stand Six:

Stand six is composed of mature log sized red pine with scattered white, jack and scotch pine with scattered hardwoods trying to grow in the understory. This stand is in need of a thinning in the next five years. These plantations are on high ground sites which are moderately well drained soils that will allow hardwood species to regenerate. The red pines have had prior harvests but are declining due to age now.

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. The harvest will consist of thinning out the pines so that the residual pines can continue growing and the hardwoods can start regenerating naturally. As foresters, our primary concern is keeping quality trees in your forest and not just selling most of your 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. Finally, a timber sale should also seek to optimize (but not necessarily maximize) the profits for the landowner in keeping with the above objectives. Conducting a pulpwood harvest would help release the residual trees as a part of a harvest operation. A pulpwood harvest would take small poorly formed and undesirable species out of the forest and allow the best quality residual trees to be released.

Timber Harvest Method: Foresters use two categories of timber harvest methods – even age 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 age 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 age 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. I recommend using even aged methods (clearcut) for Stand 6 to create more diversity and species composition of the forest. Most of the red pine should be harvested when stand 3A is cut, but some can be left for aesthetics near the clubhouse. The trees that are left can then be harvested when stands 3B & 5 are harvested if needed.

Timber Sale Timing: Timber harvests should be conducted when the soil is frozen or dry. A fall or winter harvest will reduce the exposure of wounded trees to insects (bark beetles) or disease (oak wilt). Avoid a spring harvest when possible, to minimize rutting which damages soil and the roots of the residual trees. Clearcut harvest intervals are species dependent, with red pine usually being 60-80 year rotation. This stand should be harvested between 2021-2026 along with stand 3A depending on market and site conditions. A possible harvest can occur to remove the remaining red pine when harvesting occurs in stand 3B & 5 between 2029-34 depending on market and site conditions.

Stand Seven:

Stand seven is a northern hardwood forest with mature sugar maple, white pine, red maple, cherry, red oak, and beech. The desired future condition for this stand is the continuation of northern hardwoods. This stand was harvested 10+ years ago and should be harvested in the next 5-7 years to maintain optimal growth, and to open up the understory and allow light to reach the forest floor. Leaving tops and logging slash will provide shelter for young seedlings and create wildlife habitat as well. Tops will provide valuable wildlife cover and keep them on the property. The majority of this stand is on moderately well drained to well drained soils. These soil types allow the above mentioned species to grow, but the poorly drained soils will not have as much diversity.

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. The harvest in stand seven will consist of removing mature red oak, sugar maple, red maple, white pine, cherry and beech as well as any poorly formed defective and low quality trees so that the better quality trees can grow. As foresters, our primary concern is keeping quality trees in your forest and not just selling most of your 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. Finally, a timber sale should also seek to optimize (but not necessarily maximize) the profits for the landowner in keeping with the above objectives.

Timber Harvest Method: Foresters use two categories of timber harvest methods – even age 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 age 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 age 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. I recommend using uneven aged silvicultural methods (single tree selection) for stand seven to maintain the diverse age classes and species composition of the forest.

Timber Sale Timing: Timber harvests should be conducted when the soil is frozen or dry. A fall or winter harvest will reduce the exposure of wounded trees to insects (bark beetles) or disease (oak wilt). Avoid a spring harvest when possible to minimize rutting which damages soil and the roots of the residual trees. Selection harvests are often done on a ten to fifteen-year interval. This stand should be harvested in the next five-seven years to ensure optimal residual growth.

Stand Eight:

Stand eight is the creek and creek bottom that runs through stand four, along the southwestern edge of the property. The water that runs through the creek will be utilized by wildlife, including waterfowl, deer, turkeys, amphibians, reptiles and more. Muskrats, turtles, small fish, salamanders, and other aquatic creatures depend on these areas for their survival. Erosion of the banks is the primary concern, so having a buffer during timber harvests will ensure erosion is mitigated. Allowing a buffer around this area must occur when conducting a timber harvest in adjacent areas. Buffers allow these areas to be less disturbed and prevent erosion of the soils around the pond and will allow it to be less disturbed. With surrounding areas draining into this unit, utilization of a buffer will be important. The wooded areas are close enough to warrant a 50 foot buffer to form the high water mark and the crest of the hill leading to the bank. The buffers will allow these areas to be less disturbed and prevent erosion of the soils around them.

MONITOR

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. Please use the table at the end of this plan to record notes and make modifications to this plan

as needed. Forest management plans for the American Tree Farm System do not have an expiration date but must be kept current to reflect the conditions of the forest and the goals of the landowner. The Michigan Tree Farm Committee provides a short Addendum that helps landowners keep their plan current with the Standards of Sustainability that are updated every five years.

QUALIFIED FOREST PROGRAM

The Qualified Forest (QF) program reduces property taxes by up to 18 mills for landowners with parcels between 20 and 640 acres who comply with their forest management plan to optimize their forest resources. Landowners do not have to allow the public on their land to hunt or fish, so this program is more attractive to family forest owners who own land for their own recreation. There is a \$50 application fee and an annual fee equivalent to 2 mills to help fund the operation of the program. Landowners must also report timber harvests or other forest practices in the year they occur. See www.Michigan.gov/QFP for information and program enrollment forms.

The recommendations in a Forest Stewardship Plan are voluntary unless the property is enrolled in the Commercial Forest Program or the Qualified Forest Program, especially those related to commercial timber harvests. Landowner Statement of Compliance: “I hereby acknowledge that I have reviewed this forest management plan and understand my responsibilities regarding conducting management practices and harvests as called for in the plan.”

APPENDIX

The following are included as appendices to assist the owner with future management of the forested property.

- Figure 1. 152 Acre Soils Map
- Figure 2. 152 Stand Map
- Figure 3. 152 Location Map
- Table 1. 152 Acre Soils Map Legend
- Table 2. Stand Reference Table and Recommended Management Activities

FIGURE 1.

152 ACRE SOILS MAP



FIGURE 2.

152 ACRE STAND MAP

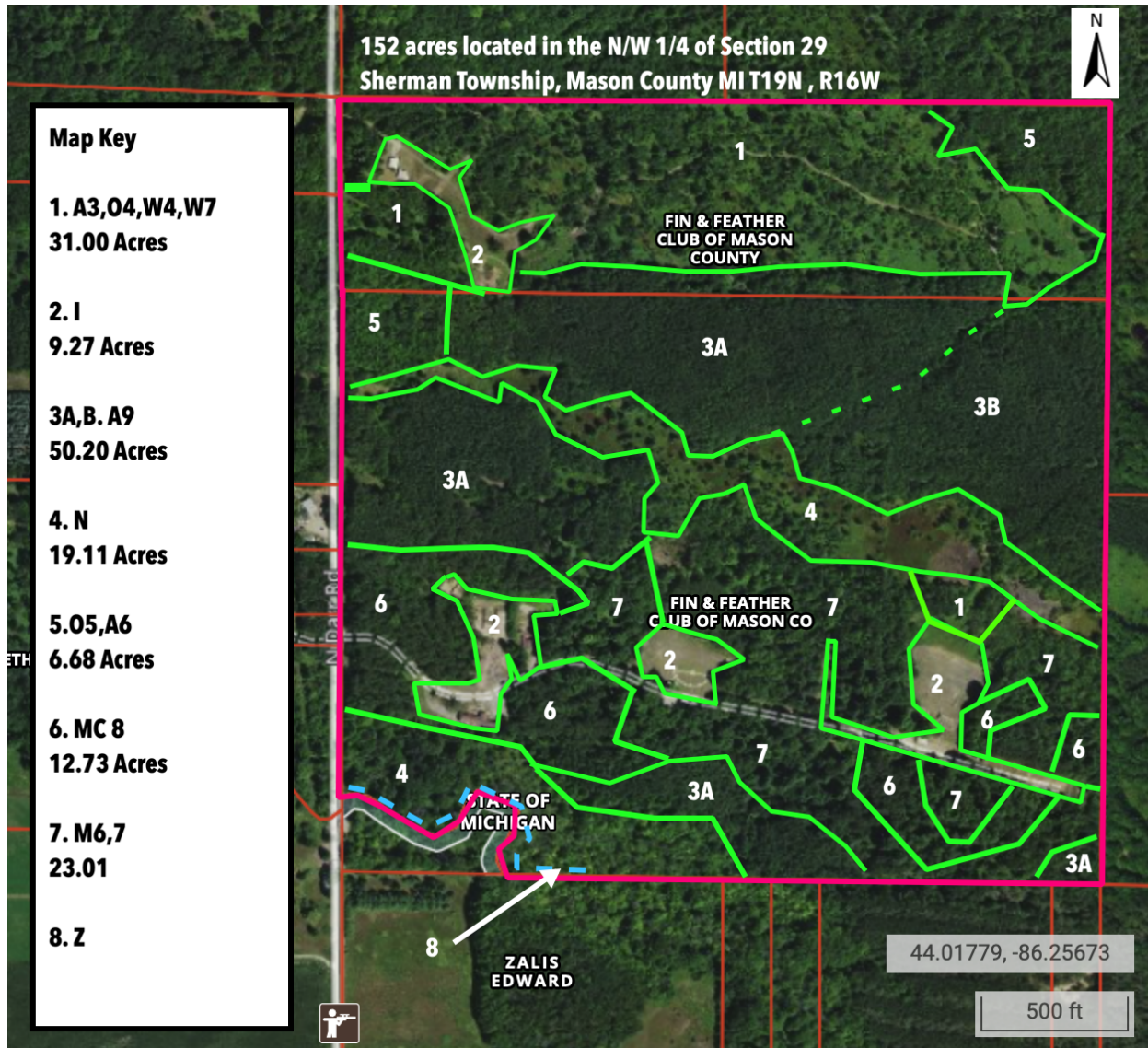


FIGURE 3.

152 ACRE LOCATION MAP



TABLE 1.**152 ACRE SOILS MAP LEGEND**

Map Unit Symbol	Map Unit Name
6	Kinross mucky fine sand
9	Kerston-Carlisle-Glendora complex, frequently flooded
41	Sickles loamy sand
42B	Grattan sand, loamy substratum, 0 to 6 percent slopes
43B	Covert sand, loamy substratum, 0 to 6 percent slopes
44B	Pipestone fine sand, loamy substratum, 0 to 4 percent slopes
52C	Wallace fine sand, 3 to 15 percent slopes
56B	Pipestone-Saugatuck sands, 0 to 4 percent slopes
58B	Covert sand, 0 to 6 percent slopes
81	Loxley and Dawson soils
90B	Epworth fine sand, 0 to 6 percent slopes
90C	Epworth fine sand, 6 to 12 percent slopes

TABLE 2.**STAND REFERENCE TABLE**

STAND	#	ACRES	ACTIVITY DESCRIPTION	DATES		MANAGEMENT
				PLANNED	COMPLETE	
1 (A3,O4, W4,W7)	1-1	31.00	Evaluate	2041		Evaluate the stand at the end of the plan and prescribe management.
2 (I)	2-1	9.27	Maintain openings	2021-41		Mow as needed to keep ranges open and not have trees encroaching.
3A, (A9)	3-1	50.20	Commercial Timber Harvest	2021-26		Clearcut Aspen and leave oaks when possible. Harvest with stand 6. Monitor Aspen regen after harvest
3B (A9)	3-2	50.20	Commercial Timber Harvest	2029-34		Clearcut Aspen and leave oaks when possible. Harvest with stands 5 & 6. Monitor Aspen regen after harvest
4 (N)	4-1	19.11	Protection	2021-41		Protection of soils and drainages and allow it to grow naturally, and without active management.
5 (O5, A6)	5-1	6.68	Commercial Timber Harvest	2029-34		Clearcut Aspen and leave oaks when possible. Harvest with stands 3B & 6. Monitor Aspen regen after harvest
6 (MC8)	6-1	12.73	Commercial Timber Harvest	2021-26		Thin overmature pines, allowing hardwood regeneration. Harvest along with stand 3A.
6 (MC8)	6-2	12.73	Commercial Timber Harvest	2029-34		Remove leftover pines if needed, allowing hardwood regeneration. Harvest along with stand 3B.
7 (M6, M7)	7-1	23.01	Commercial Timber Harvest	2026-28		Selective thinning of mature hardwoods.
7 (M6, M7)	7-2	23.01	Commercial Timber Harvest	2039-41		Single tree selection harvest or mature hardwoods.
8 (Z)	8-1		Protection	2021-2041		Protection of soils and drainages, without active management.

