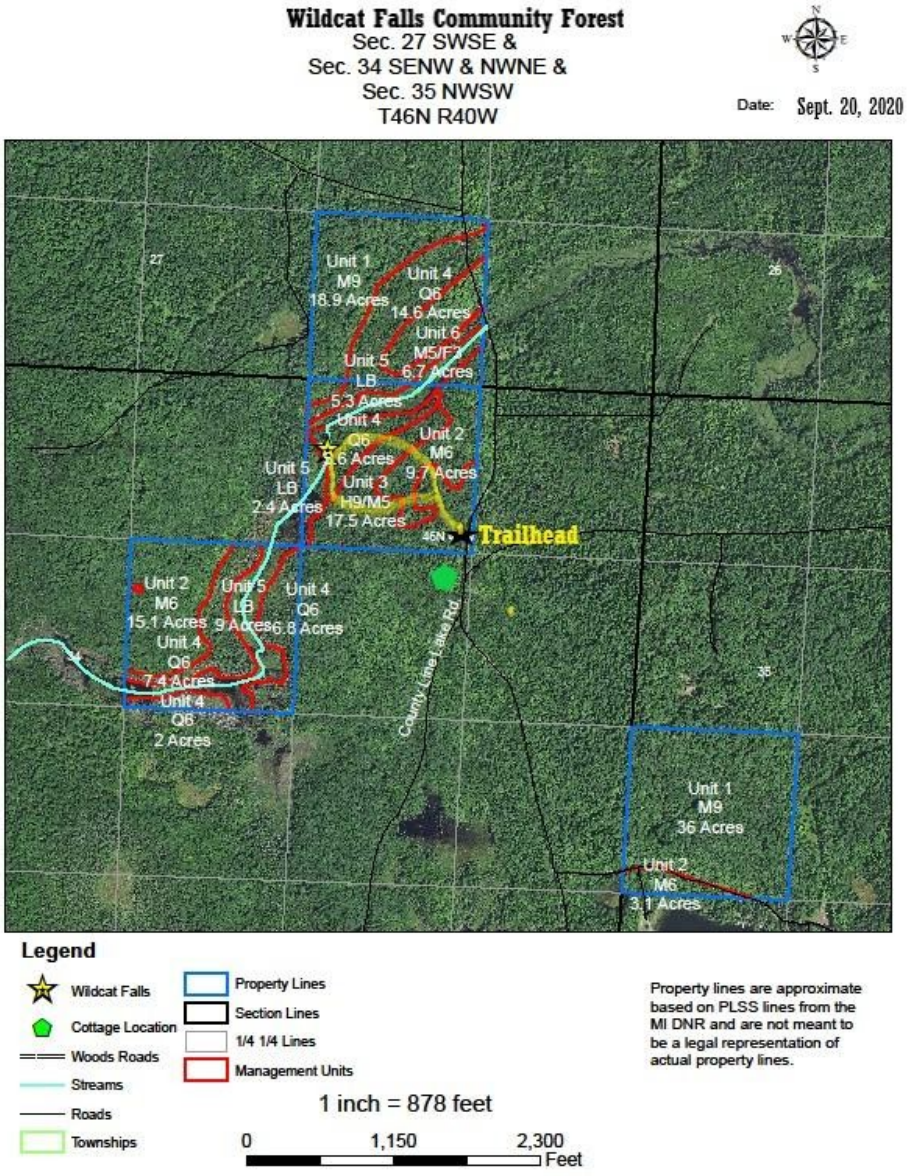
Forest Management Plan for the Wildcat Falls Community Forest mixes both active timber management with preservation and old growth protection

By John Schwarzmann

The forest management plan for the Wildcat Falls Community Forest uses both active and passive management practices to maintain the unique qualities of the community forest while providing the potential for future timber sale revenue. About half of the property is concentrated around the falls and stream corridors and is unsuited for timber harvesting for numerous reasons. Those hemlock and swamp conifer dominated forests will be managed primarily for recreation. The other half of the 160-acre property has both dense second-growth hardwoods with diameters between 5 and 15 inches and mature hardwoods between 17 and 21 inch diameter (breast height) trees. These forests are well suited for careful timber management.



For anyone taking the hike to the falls, they will pass through a hemlock, northern white cedar, white pine forest (Unit 2 on above map). The falls pass through this beautiful hemlock forest before entering a swamp. Like the other adjacent hardwood stands, it appears that the last timber cutting in this 32-arce stand occurred at least 40 years ago and perhaps as long ago as 100 years ago. The stand is a unique example of the native forest community composition and structure. It's very likely that the rugged terrain protected this forest from the large-scale elimination of conifers that occurred in the beginning of the last century across most of the western Upper Peninsula of Michigan. White pines and some hemlocks were probably cut but enough were left to preserve the native community. With the exception of cutting hazard trees along the footpath that leads to Wildcat Falls, this stand should be reserved from any active timber management for the following reasons:

1) Soils are rocky and exhibit many pockets of the somewhat poorly-drained areas that have a very high impermeable soil layer (fragipan) that impedes drainage. Vernal pools are common and tree roots are at the surface, thus exposed to damage from logging machinery.

2) The site exhibits unique bedrock outcrops with cliffs and large boulders. Logging would be extremely difficult and dangerous.

3) The forest consists of 100--140 year-old hemlock and northern white cedars with scattered white pines that are developing a super-canopy profile. This community is very rare from both a community composition and age structure perspective and is a main focus of the project's conservation motivation.

4) The rising local deer population is high enough to prevent successful regeneration of future northern white cedar and hemlock seedling establishment. Cutting any difficult to regenerate species such as eastern hemlock and yellow birch would be comparable to mining timber rather than managing a sustainable resource.

5) The site may contain both summer roosting trees and winter cave habitat for endangered bats. Bat surveys should be carried out by experts to determine their use of the site.

6) The site is very beautiful and attracts many visitors who hike the trail to the falls. Logging wouldn't be a good fit for people looking for natural beauty, solitude and peace and quiet.

7) The stand has very little timber of high quality or value. Combining this stand with other nearby valuable hardwood stands in a timber sale would likely degrade the economic value of the entire timber sale by including a difficult, low-value product. The stand exhibits high ecological value, but low economic value.

8) There are no logging roads. Any decking of wood products would need to take place on the town road.

Down and upriver from the falls is a 30- acre lowland hardwood forest (Unit 4 on above map). All of the lowland hardwoods are located on very poorly drained, frequently flooded, mucky soils. Black ash is a dominant tree species with northern white cedar as a common species with minor amounts of balsam fir and tamarack. These wetlands lie along Scott and Howe Creeks, Class 1 brook trout streams. Given the abundant seeps on the upland slopes adjacent to the lowland hardwoods, spring and groundwater movement into these sites is abundant. The likelihood that these sites freeze solid in the winter due to the water movement is very low. Black ash is often associated with well-oxygenated lateral water movement into and over muck soils. The lowland hardwood stands should be reserved from any active timber management for the following reasons:

1) Soils are extremely wet and rarely freeze and won't support logging machinery. Any attempt to log these sites would result in extreme rutting and root damage, not to mention that logging machines would get stuck requiring very expensive towing operations to salvage them.
2) These stands provide shade to help keep water temperatures cool for trout and they also provide abundant coarse woody debris for stream habitat.
3) Forest products are low value and difficult to access

Emerald Ash Borer (EAB) (*Agrillus plannipnnis*) is a non-native insect pest that is extirpating the ash genus from North America. EAB has spread over most of northern Wisconsin and much of the UP at a rate of about 2,000 – 4,000 square miles per year. It is only a matter of a short time before all the black ash will die. It remains to be seen if the site will swamp (raised water table) leading to flooding death of the other trees or perhaps there are enough conifers on the site to maintain enough evapotranspiration to prevent flooding. Black ash forests in other locations are being converted to alder swamps when conifers are rare. Perhaps some wetland species planting could be considered in the future.

The forests that are suitable for timber management can be divided into three separate, unique types of forest. The largest area is located on the 40-acre tract mainly north of McGinty Lane on the side slopes and top of a drumlin-like hill on the Winegar End Moraine landform (Unit 1 above). This mature forest is dominated by sugar maple sawtimber 17-21 inches DBH, with very tall, excellent quality basswood. These two species make up nearly 99% of the canopy trees. Stocking of sawtimber and hardwood pulpwood is exceptionally high.

Tree heights of canopy dominants range from 80- 92 feet for sugar maple and 85 to 100 feet for basswood. Timber quality is highly correlated with tree height. The tallest sugar maple trees often have a veneer-quality butt log and the basswood exhibit 10 to 30 feet of veneer logs. Veneer and grade 1 logs make up about 50% of the sugar maple sawtimber fraction and 70% of the basswood. The high quality sawlogs provide an opportunity for a substantial revenue timber sale under the right market conditions.

Dominant trees are 100 to 130 years old and were likely seedlings and saplings that were released following a past heavy cut. Due to excellent site quality, the stand can be carefully managed with intermediate thinning, designed to maximize crop-tree potential for the next several decades. Invasive earthworms, and particularly nightcrawlers (*Lumbricus terrestris*) are very abundant and have drastically altered the forest floor. The duff layer has been eliminated with a corresponding huge drop in herbaceous species and fungi. By late summer, the forest floor is extremely hard, bare soil. Invasive earthworms alter nutrient cycling and water retention, pulling large quantities of organic matter deep below the rooting zone.

On the far north side of the Wildcat Falls parcel is another mature 19-acre hardwood forest. (Also Unit 1 above) This mature forest is noteworthy in that it has a significant fraction of large hemlock and yellow birch, species that were cut out of most northern hardwood stands in past timber harvests. Stocking of small and medium sawtimber and hardwood pulpwood is exceptionally high. Tree heights of canopy

dominants range from 75-85 feet for sugar maple and 85 to 90 feet for basswood. Timber quality is only fair as there are few crop-trees (19/acre) that can increase in grade over the next several cutting cycles. In general, fewer than 35 crop trees/acre is a sign of past high-grading or poor growing conditions for the dominant species. Since this stand has good drainage for sugar maple, it would normally exhibit more crop trees.

Dominant trees are 120 to 170 years old and were likely seedlings and saplings that were released following a heavy cut in the past. The lack of stumps and very high density indicate that the site hasn't been logged in at least 40-50 years. Due to below average number of crop trees, the stand should be managed with thinnings, designed to release advanced regeneration to establish new age classes. Like most northern hardwood stands outside of the Lake Superior snowbelt, regeneration and pole-sized trees are very sparse due likely to deer browsing and very dark conditions with high competition and few gaps. No invasive plant species problems or earthworms were observed during inventory activities.

High Conservation Value Forest (HCVF) – This hemlock/hardwood forest has a distribution of diameters of canopy trees with predominantly large tree sizes between 18-24 inches DBH. It reflects past timber harvest activities that removed most of the large conifers such as hemlock and white spruce but lightly cut hardwoods. Unlike most managed stands, the number den and snag trees is approaching levels estimated for the original climax forest as these components derive from lots of dead wood which is uncommon because trees are cut before they decline and die in managed forests. The large diameter trees and abundant snags are rare on the regional landscape so that this forest is worthy of HCVF management that strives to maintain its unique features such as seeps, vernal pools and retains at least 4 large legacy trees per acre to live out their life and create future snags.

On the SW corner of the Wildcat Falls tract is a 18.6 acre second-growth, even-aged northern hardwood forest dominated by sugar maple pulpwood that regrew after hemlock-hardwood stands were heavily cut for bark about 80-100 years ago. (Unit 2 above) Drainage is variable with low areas containing red maple and slow-growing sugar maple. The only crop-trees are capable of growing into more valuable sawlogs and veneer are found in areas with some side slopes and better drainage.

Future efforts should be made to regenerate gaps to establish new age classes. It appears that this stand has never been thinned. There are no stumps and the density is very high. Like most northern hardwood stands outside of the Lake Superior snowbelt, regeneration of all tree species besides unpalatable balsam fir, ironwood and white spruce that are 6 feet or higher (above the deer browse line) are very sparse due to deer browsing and very dark conditions with high competition and few gaps. No invasive plant species problems or earthworms were observed during inventory activities.

Future Timber Harvests – The three forest areas suitable for timber harvesting could be marked for a timber sale at any time due to their very high density. Complicating the decision, however, is the poor economy. Currently, timber prices are very depressed. It isn't unusual for timber sales in northern Wisconsin and the western UP that are heavy to hardwood pulpwood to receive no bids on the open market.

Under good market conditions, even a modest forest thinning could generate significant revenue in a range of 50 to 60 thousand dollars every 15-20 years. That revenue could be used towards tree planting and protective fencing or towards the purchase of other significant conservation properties. While it may make sense to wait and hope for better future market conditions, it may be just as likely that market conditions remain poor or deteriorate even further.

If or when a timber sale is marked and sold, the goals of the sale will be to maintain the high conservation features while providing the growing space for new age classes of trees and allow existing trees to maintain excellent growth and vigor with increased light and soil nutrients available under lower densities. While some small gaps will be created, the overall forest canopy will still be present thereby maintaining the site's beauty.

John has a Masters degree in Forestry. He wrote a very detailed timber management plan for the Wildcat Falls Community Forest. Following a long career in conservation with the State of Wisconsin Board of Commissioners of Public Lands, he has recently retired. PIF & NWA are proud to have him on board as VP of both organizations. We are grateful he shares the rationale in the plan with us all.

Note: The timber plan described in this rationale is incorporated into the Wildcat Falls Community Forest management plan. Besides PIF and NWA board members who assisted in the plan, we give special thanks to Ron Eckstein (wildlife) and Rachel Hovel (aquatic & editing) for their efforts into the greater plan. The whole plan is available electronically on request.