COMMUNITY FOREST PLAN
LAUGHING WHITEFISH COMMUNITY FOREST

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ALGER COUNTY, MICHIGAN

INTRODUCTION

The *Laughing Whitefish Community Forest* (82 acres) is located adjacent to Lake Superior in Onota Township, Alger County, Michigan (Figure 1). The parcel includes the mouth of the Laughing Whitefish River, located in the Betsy-Chocolay Watershed (USGS HUC: 04020201). The Betsy-Chocolay Watershed contains 40.79 percent of the coastal wetlands in the regional coastal area and 20.93% of Lake Superior coastal wetlands, along with over 20% of the sand beaches found in Lake Superior (*Lake Superior Biodiversity Conservation Assessment and Strategy*, 2015). The parcel is dominated by forested uplands (including old growth white pine), forested and emergent coastal wetlands, the mouth/estuary of the Laughing Whitefish River, and Lake Superior sand beach.

Preservation of the wetlands will provide habitat benefits for wildlife and bird species as well as multiple species of sportfish including: walleye, lake trout, and lake whitefish. According to the Michigan Natural Features Inventory, the Betsy-Chocolay Watershed includes at least 99 species and communities of conservation concern, 80 of which have variability rankings which indicate the species or community is currently present or was at the date of the last sampling (*Lake Superior Biodiversity Conservation Assessment and Strategy*, 2015). In a time and place where suitable coastal properties are highly desirable for residential building, preserving the natural state of such areas is critical to the success of resident plant and animal species. The property is in pristine condition with no structures.

COMMUNITY FOREST OBJECTIVES

Primary objectives of the community forest include:

1. Protect and sustainably manage forest health to benefit Lake Superior, plants and wildlife, and the community
2. Protect and maintain undeveloped Lake Superior shoreline and adjacent forested area from residential development
3. Provide K-12 place-based educational opportunities to regional youth
4. Provide recreational benefits and public access
5. Provide opportunities for sustainable economic development
6. Serve as a model of effective forest stewardship to nearby landowners

Figure 1. Laughing Whitefish Community Forest Locator Map

NATURAL FEATURES

The Laughing Whitefish Community Forest includes eighty-two acres of old growth northern forest bordered by 2,000 feet of Lake Superior shoreline. Land use/cover types include lowland hardwoods, coniferous forest, and extensive riparian and Great Lakes coastal wetlands (Figure 2). In total, the parcel is approximately 95% forested with very little topographical relief (Figure 3).

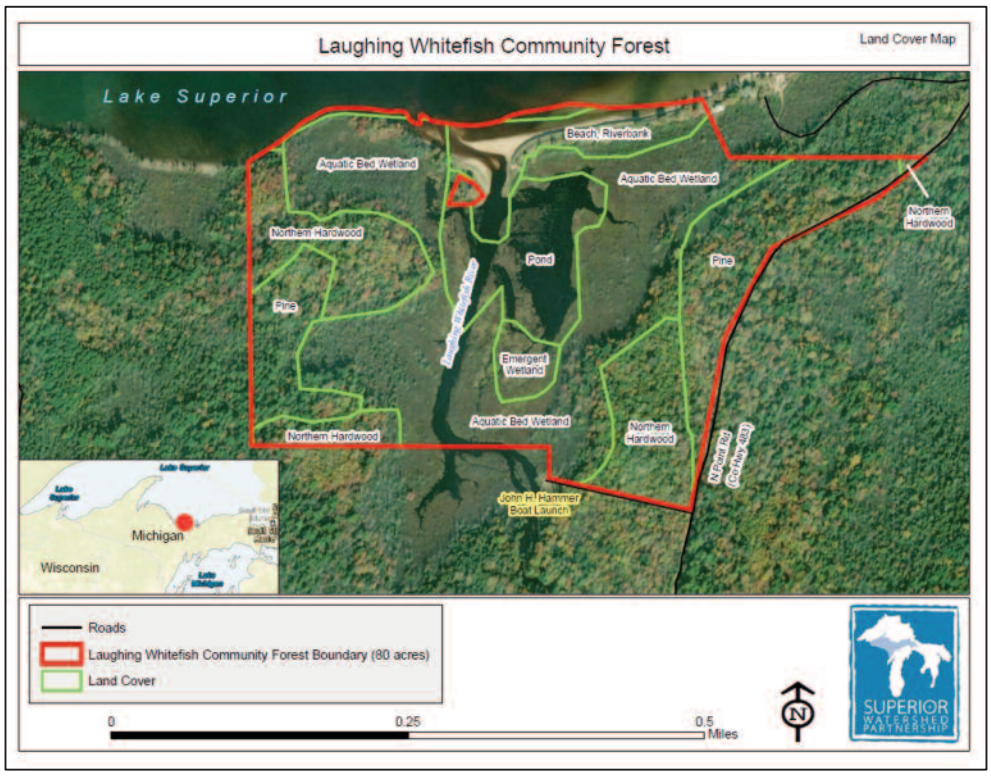

Figure 2. Major Land Cover Types

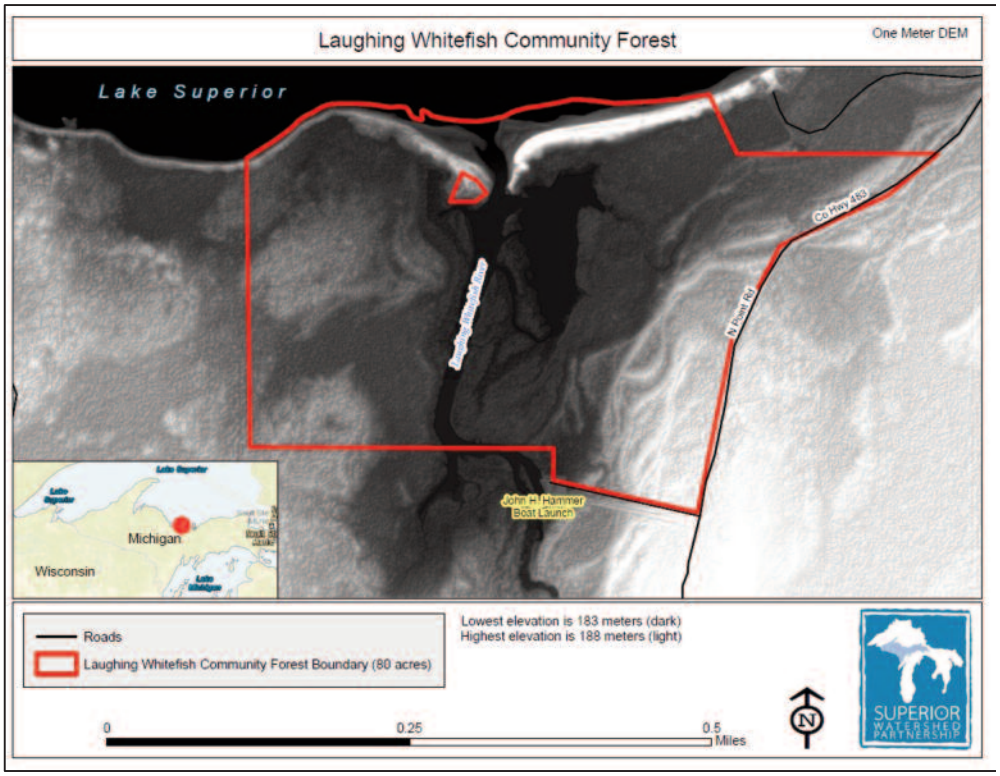

Figure 3. Digital Elevation Model Showing Topographic Relief/Elevation

The US Fish and Wildlife Service National Wetlands Inventory Mapper indicates that approximately 60% of the parcel (48.9 acres) is comprised of emergent and forested wetlands (Figure 4). The wetlands are supported by very deep, very poorly drained soils including *Histosols and Aquents, Ponded Complex* which includes a seasonal high water table at the surface and/or ponded up to one foot all year. The remaining soil types on the parcel include the more moderately drained and rapidly permeable complexes that support upland vegetation (Figure 5).

The SWP worked with a SAF Certified Forester from the Alger and Marquette County Conservation Districts to assess the parcel and develop the sustainable forest management recommendations included below:

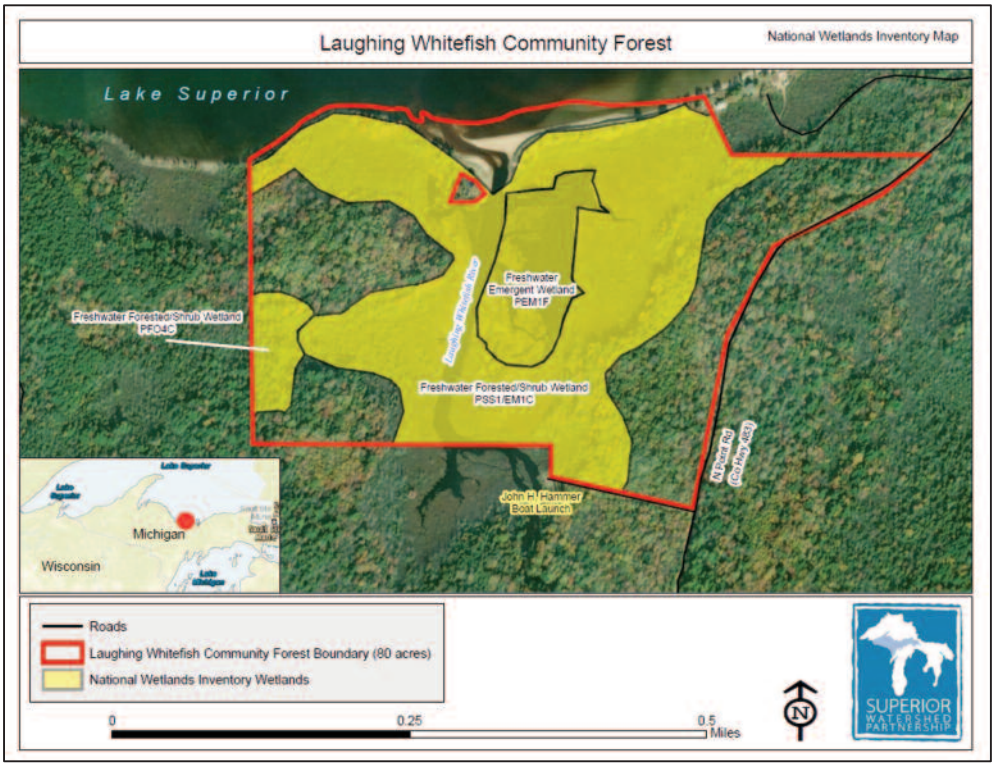

Figure 4. National Wetlands Inventory Map Showing Freshwater Emergent and Forested Wetlands

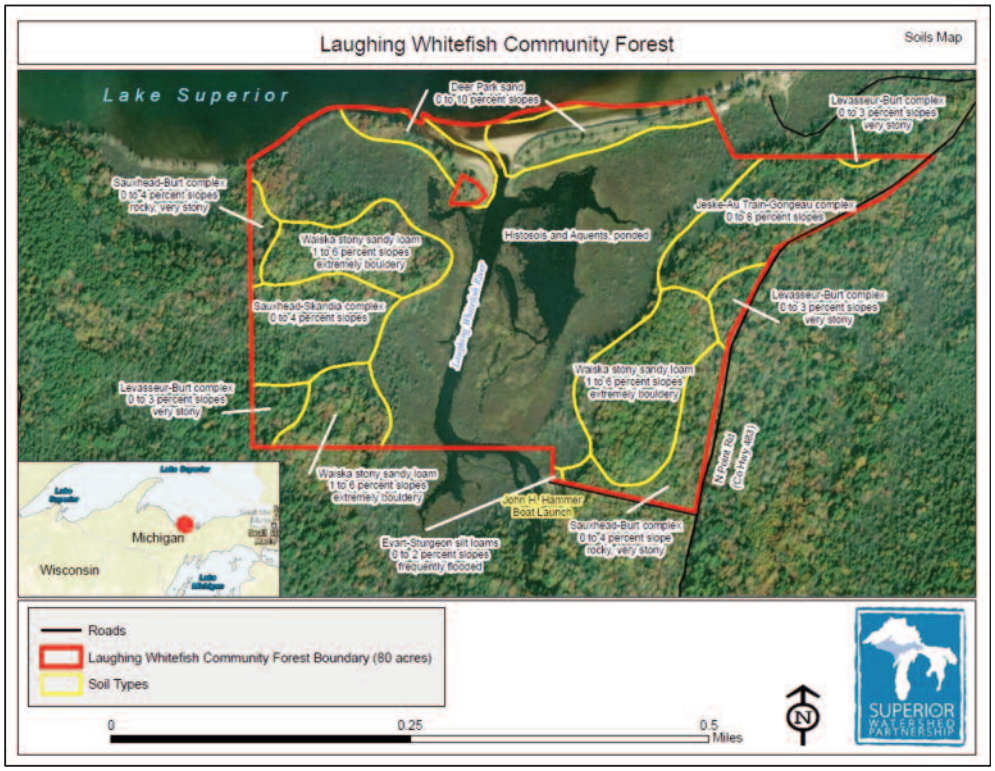

Figure 5. Soil Types from the Natural Resources Conservation Service Alger County Soil Survey

WEST SIDE OF THE LAUGHING WHITEFISH RIVER

The west side primarily included three forest types, as well as the alder edges and marsh. Any recommended treatments will be challenging as to the access and wet ground surrounding and incorporated into these stands. The first type is found along the shoreline of Lake Superior, and consists of ash, red maple, and small conifers of spruce and balsam. The main concern here is dieback and obvious mortality of the ash, due to harsh conditions, and potential emerald ash borer infestation. This stand is very small and thin, bordered by tag alder, extensive wetlands, and a small "land bridge" to the more mature forest.

The next forest stand type consists of pole sized timber including red maple, balsam fir, and a few scattered white birch. It seems these areas are found where old camps/homesteads existed and/or small disturbances occurred. Average diameters here are around 4-6" at breast height (DBH), and are fairly consistent throughout these pockets. Recommendations here would be to allow growth and development of the pole timber, which should naturally thin out over time and result in larger red maple stems. Because of the fir and subsequent tight canopy, regeneration here is minimal, and includes very small seedling variety (maple and some cedar). Ground species here and throughout the west side include leatherwood, starflower, ferns,

club moss, and some honeysuckle, which may need to be addressed. More honeysuckle was found on the east side of the parcel as well.

Primarily, the forest on this side consists of very large stems of "old growth" appearance. Hemlocks, cedars, and red maple stems were found up to 28" DBH with excellent canopy size and shape, along with excellent old snag and den trees. There is a bit more regeneration under these larger canopies, but deer browse was very evident and may be a reason why there is a lack of developed saplings. Management here would include a "do nothing" approach for reasons including access and wet terrain, but also for retention of these unique areas with large stems.

EAST SIDE OF THE LAUGHING WHITEFISH RIVER

The east side of the parcel, and east of the Laughing Whitefish River, consists of similar forest types, but with some differences as well. Again, there are areas of pole sized timber, primarily red maple and balsam fir, with aspen and birch along some edges where there is more sunlight infiltrating into the stands. There are also groves of large stemmed hemlock and some cedar intermixed in the hardwoods, which adds to the diversity of species and to the structure of these conifers and their spreading branches. Otherwise, this stand is composed of red maple and sugar maple, with a good diameter distribution. However, there is an abundance of larger stems. The overall appearance of this area is, again, similar to old growth hardwoods, with patches of pole sized regeneration and saplings, and less deer pressure and browse than the west side stands, which results in more seedling and sapling density where there is sunlight. There are also large snag and den trees throughout, adding to the old growth appearance.

There are a few scenarios for management of this area. One option would be to do nothing to maintain and retain the stand as is. The downfall of this is the reduction of regeneration due to a lack of sunlight, and poor development of seedlings and saplings. The overall structure would not be very beneficial for most wildlife, except some songbirds and small mammals. The high amount of large stems is not the best for optimum hardwood productivity either, and on a "reverse J curve" used in hardwood management, there would be graphic evidence of an over-abundance of large diameters. The reverse J curve shows a greater amount of small stems, and decreasing numbers in tree density as the diameters increase. This would be the basis of the second recommendation option, which would include an overstory removal, or a target harvest of most of the larger hardwoods. There are many trees that are over-merchantable size, so not all of the larger stems could be removed, but to target them primarily to bring

the stocking levels closer to a reverse J curve would increase overall productivity and regeneration. The large canopy gaps left would also help to increase the diversity of the stand with sun tolerant species such as birch, oak, and young confers, and would benefit wildlife by creating browse material and small forest edges. The third potential recommendation would be for a sugar bush effect through harvest. This would target sugar maple sap production by releasing larger, healthy stems from competition through crop-tree release. This approach would retain many stems in the 12-18" Diameter at Breast Height (DBH) range, while removing poor quality and tightly spaced trees. Any of these recommended scenarios could be used as an educational tool to showcase the specific management that is undertaken. Ground species were similar to the west side, but did include Bishop's weed/goutweed along the North Point Rd., most likely introduced by landowners travelling to and from the cabins on the shore.

COMMUNITY BENEFITS

The Laughing Whitefish Community Forest is located in Alger County (population 9,383), approximately 20 miles from the City of Marquette (largest city in the Upper Peninsula; population 20,570) and Northern Michigan University (NMU; 8,303 students). All-season outdoor recreation and tourism accounts for a substantial portion of the local economy, and the establishment of the community forest will provide numerous year-round economic, environmental, recreational, and educational benefits. Economic benefits will include but are not limited to increased nature tourism and related sustainable economic development (lodging, meals, travel, etc.). Environmental benefits will include but are not limited to perpetual protection of critical coastal wetlands, a substantial parcel of northern forest, important habitat, and threatened or endangered plant and animal species.

Educationally, the community forest will provide forest-based learning opportunities including climate adaptation education targeting K-12 students as well as educational and research opportunities for NMU students. The SWP will incorporate K-12 students in initial forest planning and interpretive sign development. Teachers and students from local schools will have the opportunity to experience forest-based learning and to gain hands-on experience in environmental restoration and management. Additionally, Northern Michigan University professors and students will have the opportunity to utilize the forest for research purposes and to be involved in field tasks including restoration and long-term monitoring.

Moreover, public access will provide opportunities for community

members to experience and enjoy a unique ecosystem incorporating northern forest, coastal wetlands, and undeveloped Lake Superior shoreline. The community will be able to enjoy recreational benefits including but not limited to new hiking trails, new cross-country ski trails, nature watching opportunities, (birds, wildlife, plants, etc.) and public access to Lake Superior beachfront. Private landowners may also utilize the proposed community forest as a replicable model for effective forest stewardship when establishing plans relating to the future of their own properties.

COMMUNITY INVOLVEMENT

Involving the greater Marquette and Alger County communities in the preservation and long-term management of the parcel is both important to the previous landowners and central to the success of the proposed community forest. Numerous organizations and individuals supported the purchase of the property and participated in development of the Community Forest Plan. They include, but are not limited to, the Marquette and Alger County Conservation Districts, Keweenaw Bay Indian Community, Northern Michigan University, the Upper Great Lakes Stewardship Initiative (UGLSI), adjacent landowners, and members of the public. Many of these organizations and individuals have confirmed that they will partner with the SWP for implementation of the Community Forest Plan. The role of partners will be to provide assistance with on the ground efforts to effectively manage the forest, public outreach, and educational opportunities.

In addition, the SWP will utilize its Lake Superior Volunteer Corps to engage a broad audience of local citizens and tourists in Community Forest activities. The Lake Superior Volunteer Corps works side by side with the SWP Great Lakes Conservation Corps (GLCC), allowing visitors to Lake Superior to add a day of environmental restoration work to their vacation itinerary. Work day events include hands on activities such as interpretive sign installation, trail construction and maintenance, invasive species removal, native plantings, and general site maintenance/clean-up. The Lake Superior Volunteer Corps was recently awarded the Governor's Service Award for O*utstanding Volunteer Program* for providing people who love visiting Lake Superior the opportunity to help protect the lake and its watershed. The program is also available for local residents, businesses and community organizations.

COMMUNITY FOREST USES

In an area and time where vacant coastal parcels are highly sought for residential development, the community forest will serve as a permanent public location for residents and tourists to experience the northern forest and coastal wetland ecosystem and to access the shores of Lake Superior. Additionally, the forest will serve as an easily accessible, local educational resource for area K-12 and university students.

IMPLICATIONS OF CLIMATE CHANGE ON LANDSCAPE MANAGEMENT AT THE LAUGHING WHITEFISH COMMUNITY FOREST

The variable effects of climate change are altering Northern Michigan forests and other ecosystems, and can be attributed to changes in important cultural, economic, and environmental factors. In Michigan, the four heaviest rain events per year contain 35% more water than they did 50 years ago (US EPA 2016). These heavy rains lead to increased sedimentation, nitrates, phosphates, E. Coli, and other pollutants entering waterways leading to beach closings and algae blooms. In addition, northern forest compositions are changing. In particular, the Upper Peninsula of Michigan may see declining paper birch, quaking aspen, balsam fir, and black spruce populations and increasing populations of oak, hickory, and pine trees (US EPA 2016). Furthermore, the central and eastern regions of the Upper Peninsula are projected to experience more extreme temperature changes than other parts of Michigan (GLISA 2014).

Figure 1.—Ecological Sections VII and VIII in Michigan (green shading), and the 40 counties that were used to approximate the assessment area when county-level data were required. Modified from Albert (1995).

The Climate Change Response Framework conducted a series of vulnerability assessments for the Northwoods region supported by 27 science and management experts from across the area aka the "Northwoods Framework." The experts agreed that current and anticipated climatic changes suggest the following main points for the Laurentian Mixed Forest Province of the eastern Upper Peninsula and northern Lower Peninsula of Michigan found: 1). Increased precipitation 2). Increased daily maximum temperatures, particularly in winter 3). Potential increase in mean annual temperature of 2.2 to 8.1 ºF for the region 4). The most vulnerable forest communities in the assessment area include upland spruce-fir, jack pine, lowland conifers, and red pine-white pine forest communities (Handler et al. 2014).

Projected climate trends anticipated for the next 100 years were determined using downscaled global climate model data. The suggested management implications in the Northwoods Framework report include (summarized) 1). Following state/federal guidance and developing wildlife action plans to protect and support wildlife, and specifically rare, threatened, and endangered species. 2). Adapt fire and fuel policies specific to land use in particular regions to address ecosystem and human health concerns exacerbated by drought conditions. 3). Replace water infrastructure such as culverts, bridges, and shoreline roads following 100-year flood plans. Use hydrologic modeling where possible to identify high runoff zones. 4). Prioritize the preservation of stream margins, as reduced shading could cause the effects of warming temperatures to compound with severe consequences for fish populations and other aquatic life. 5). Adapt forest harvest and management practices for anticipated changes in tree species diversity related to heat-stress and tolerance levels. 6). Manage forests for non-timber products such as food, medicine, and craft. In addition, protect cultural, archeological and historical resources. 7). Adapt forest harvest and management practices for shorter seasons of frozen ground and reduced harvest windows. 8). Manage forests using strategies for increasing carbon storage with enhanced regeneration, competition control, fertilization, and superior stock 9). Plan for increased infrastructure maintenance on trails, campsites, structures and hazard tree removal in wilderness areas due to increased storm events. 10). Plan to adapt to challenges and increased infrastructure maintenance at cultural heritage sites. 11). Plan to shift tourist and local recreational focus from winter-sports to warmer-weather activities. 12). Plan, adapt, and inform the public about regional increases in human diseases and vectors of transmission 13). Plan, adapt to challenges and plant a variety of highly tolerant species at urban and community forest sites (Handler et al. 2014).

MANAGEMENT RECOMMENDATIONS

Long-term management and monitoring of the community forest will be conducted by the SWP. SWP staff possess expertise in watershed and conservation planning, environmental restoration, pollution prevention, field inventory, water quality monitoring, site design, project administration, and coordinating project partners and contractors. The SWP worked with a SAF Certified Forester from the Alger and Marquette County Conservation Districts to develop the sustainable forest management recommendations that are highlighted below. It is anticipated that more partners will be added as the project progresses and public opinion will continue to be sought to best incorporate community goals in long-term forest management decisions. All

planned community forest uses and management activities complement local zoning and land use plans adopted by Onota Township and Alger County

- Timber Harvesting: No commercial timber harvesting will take place on this property. The lands will be managed as a community forest, with an emphasis towards education. Understory thinning may take place in some areas for trail construction but will be limited. All thinning activities will be conducted by hand and resulting material will be piled and burned or chipped.
- Forest Health: Forest health will be monitored on a yearly basis to reduce the impact from abiotic and biotic factors. This is a healthy forest. The only apparent health issue identified is the possible presence of emerald ash borer which has resulted in the subsequent decline and mortality in the ash resource. It is recommended that no action be taken to address this issue at this time. If additional forest health issues are detected, such as bark beetle or other insect outbreaks, management recommendations may change in order to protect the forest.
- Invasive Species: Invasive tree/plant species inventories will be conducted each year. If invasive species are identified on the property, an integrated pest management plan will be developed, as needed, to eliminate the invasive species. The only invasive plant species that has been identified on the parcel is the somewhat invasive bishop's weed or goutweed that occurs along the border with the main road. This species should be controlled to prevent further spread. Control methods include hand pulling (digging the entire plant out), solarization that uses heat trapped under tarps to burn and suffocate the plants and rhizomes, and herbicides.
- Hazard Tree Identification: For the safety of the staff and visitors, hazard trees near parking areas, trails and picnic areas will be removed. A hazard tree is defined as a dead or dying tree, heavy leaning tree, or a tree with structural issues that can fall into or upon areas used by pedestrians. Surveys will be conducted each year by a forester, certified arborist, or an individual trained in identification of hazard trees. Hard and soft snags will be maintained throughout the property as they provide key habitat elements in a healthy forest environment; however, safety will be the main priority.
- Fuel Reduction /Fire mitigation: Wildfire is not a significant risk in this county or for the hardwood forest types on the property. Reduction of fuels around the designated parking area or adjacent to public roads may help reduce the chance of ignition.

IMPLEMENTATION STRATEGIES

The property is in pristine condition with no structures. A small gravel lot/boat launch located adjacent to the Laughing Whitefish River provides a centralized access point to the community forest. Planned improvements include hiking/ski trails and interpretative nature signs throughout the property. The SWP will utilize its Great Lakes Conservation Corps (GLCC) work crews to implement on-the-ground forest improvement objectives including but not limited to trail construction, invasive removal, and native plantings. Additionally, public opinion will be sought and community volunteers will be incorporated to best implement community forest objectives.

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LAUGHING WHITEFISH COMMUNITY FOREST PHOTOS