EAGLE'S NEST COMMUNITY FOREST PLAN

Lake Superior Old Growth Forest and Coastal Wetland

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COMMUNITY FOREST PLAN
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MARQUETTE COUNTY, MICHIGAN

INTRODUCTION

The *Lake Superior Community Forest: Old Growth, Coastal Wetlands and Sand Beach* property is located northwest of the City of Marquette (population 22,000), the largest city in the Upper Peninsula of Michigan (Marquette County; T49N, R26W, Section 13) and includes old growth northern forest bordered by 1,130 feet of Lake Superior shoreline (Figure 1). Located adjacent to Eagle's Nest Road, the Forest has been commonly referred to as *Eagle's Nest Community Forest*.

The Eagle's Nest Community Forest property is located in the Dead-Kelsey Watershed (USGS Hydrologic Unit Code: 04020105), which contains some of the most extensive coastal wetlands in the Lake Superior basin. The property was purchased by the Superior Watershed Partnership and Land Conservancy (SWP) during May of 2018 with funding from the U.S. Forest Service's Community Forest and Open Space Program and a substantial donation from the private landowner. The 17-acre parcel had been owned by the same local family since 1870. Protecting this unique coastal forest and coastal wetland is a community priority. The property is in pristine condition with no structures. The only current improvement is a small gravel parking area which could provide parking for access to the proposed community forest trailhead. Planned improvements include hiking trails and interpretative nature signs throughout the property.

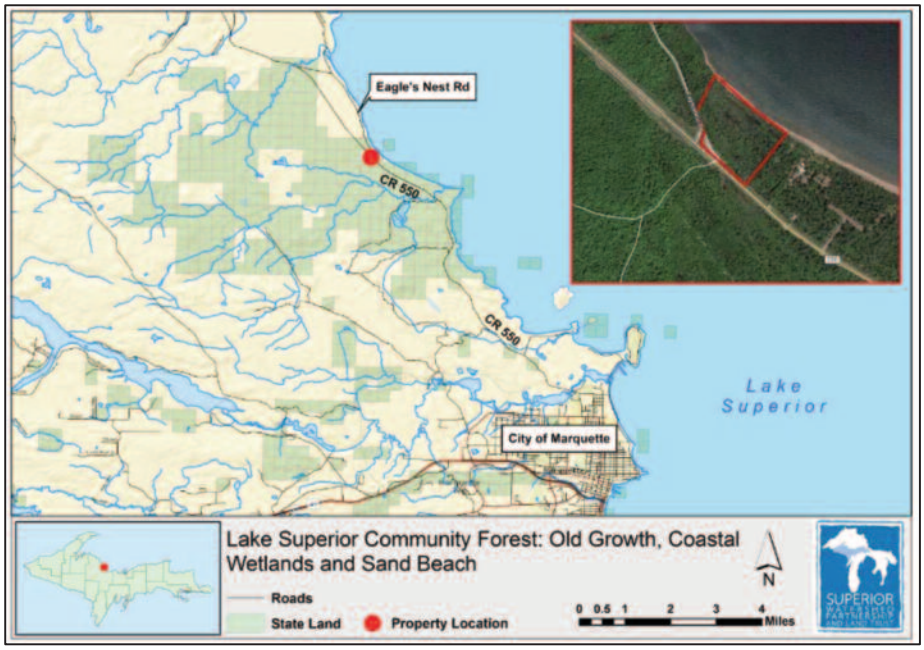

Figure 1 Eagle's Nest Community Forest Locator Map

COMMUNITY FOREST OBJECTIVES

The SWP, in cooperation with partners, will protect the property in perpetuity and manage the property pursuant to Community Forest Program regulations and the guidelines of this plan. The primary objectives of the community forest include:

- Protect and sustainably manage forest health to benefit Lake Superior, plants and wildlife, and the community
- Protect and maintain 1,130 feet of undeveloped Lake Superior shoreline and adjacent forested area from residential development
- Provide K-12 place-based educational opportunities to regional youth
- Provide recreational benefits and public access
- Provide opportunities for sustainable economic development (nature-based tourism)
- Serve as a model of effective forest stewardship to nearby landowners

NATURAL FEATURES

The Eagle's Nest Community Forest includes seventeen acres of old growth northern forest bordered by 1,130 feet of Lake Superior shoreline (Figure 2). Land use/cover types include Lowland Hardwoods, tag alder and cedar marsh, and upland hummocks of white pine old growth. In total, the parcel is approximately 95% forested with very little topographical relief (Figure 3).

The Lowland Hardwood area consists of red maple, balsam poplar (commonly known as BAM or BALM) regeneration along the highway area, black ash, and balsam fir, and scattered cherry. The understory consists of regeneration of these species, as well as red osier dogwood, and scattered tag alder. Ground species are abundant and diverse, and include thimbleberry, juneberry, marsh marigold, blue flag iris, and wild strawberry. There is good regeneration found here, including ash seedlings, but there is also the presence of emerald ash borer and subsequent decline and mortality in the ash resource. The water level is extremely high at this time due to record high water levels in Lake Superior, and this will most likely lead to continued mortality of the alder, and other species. Fortunately, there are currently no signs of Spruce Budworm in the Balsam Fir.

The tag alder and cedar marsh is very wet and under more water than what can sustain tree growth. These areas are somewhat open, with grasses, tag alder, and dead standing cedar. Red osier dogwood is regenerating well, and there is at least one higher pocket where there is live cedar.

The upland area along the south border of the property is dominated by old growth white pine including a few stems that are over 40" in Diameter at Breast Height (DBH), along with white spruce, and red maple. There is also abundant advanced regeneration of white pine, balsam fir, and white spruce in this area. Similar understory species are found here as in the Lowland Hardwood stand, and forest management practices are not recommended for this area. The area along the beach can be lumped into this stand, but consists of smaller, younger stems of white pine, red maple, and dead ash. There is a culvert and beaver pond along the edge of this stand and near the road. Along this border with the main road are native species such as milkweed, but also a somewhat invasive species known as bishop's weed or goutweed. The transition between the balsam poplar regeneration and this area also has abundant quaking aspen saplings which adds to the diversity and age classes of trees.

The US Fish and Wildlife Service National Wetlands Inventory Mapper indicates that approximately 32% of the parcel (5.5 acres) is comprised of forested/shrub coastal wetlands (Figure 4). The wetlands are supported by the very deep, very poorly drained soils of the Tawas-Deford complex which formed in organic deposits overlying sandy outwash. Other soil types on the parcel include the more moderately drained and rapidly permeable Croswell-Deford complex and the excessively drained and rapidly permeable Waiska Series (Figure 5).

Figure 2 Aerial photograph showing property boundary

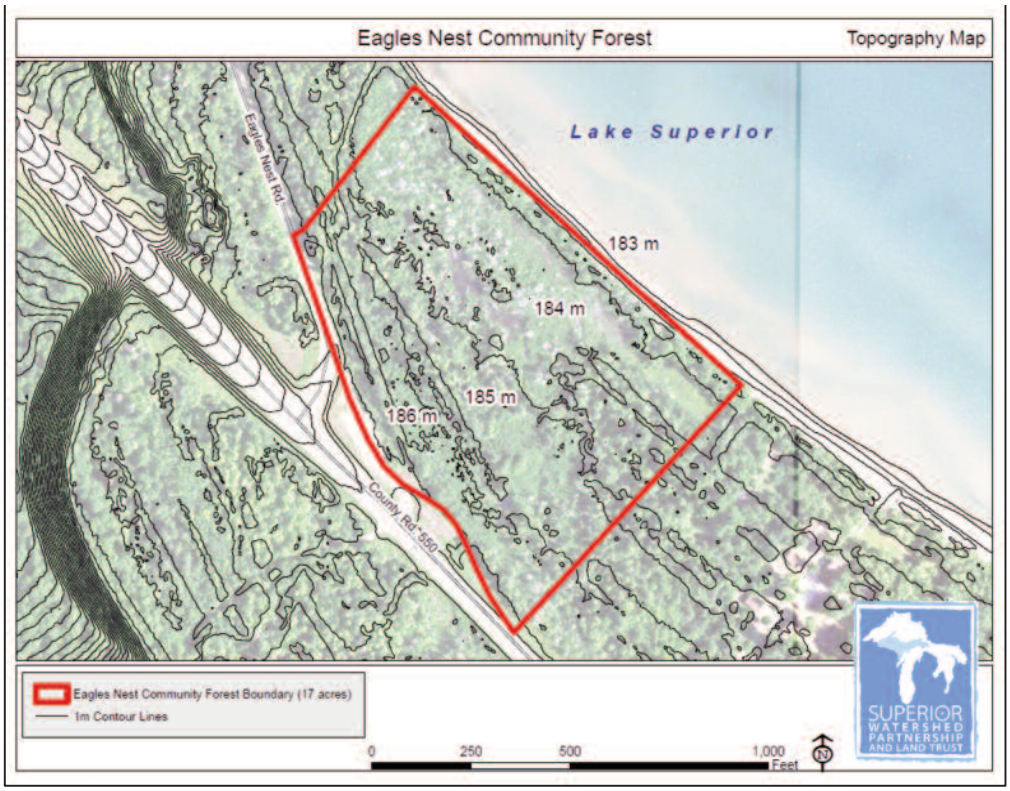

Figure 3 Elevation map showing topographic relief

Figure 4 Coastal Wetlands from the National Wetland Inventory

Figure 5 Soil types from the USDA Soil Survey Database

The Michigan Natural Features Inventory (MNFI) notes that 74 species of Special Concern (SC), threatened (T), or endangered (E) species have been observed in Marquette County. Of those, a minimum of six have been recently observed and frequent northern coastal forest and/or wetland habit types, including: Northern Goshawk (SC), Red shouldered hawk (T), Wood Turtle (SC), Bald Eagle (SC), Black-Backed Woodpecker (SC) and the Dwarf Bilberry (T).

COMMUNITY BENEFITS

The Eagle's Nest Community Forest is located in Marquette County (population 68,883), seven miles from the largest city in the Upper Peninsula. Seasonal and permanent residents include Northern Michigan University students (population 9,000) as well as members of the nearby Keweenaw Bay Indian Community (KBIC). Additionally, outdoor recreation and tourism has increased dramatically in recent years partly due to highlighting features in publications such as *Outdoor Life* and *Delta Sky* magazines as well as the *Pure Michigan* tourism campaign. Because of its close proximity to the city and easy accessibility, the community forest is expected to provide multiple benefits to area residents and visitors year-round. Notably, forest-based learning opportunities targeting K-12 students as well as educational and research opportunities for Northern Michigan University students will be available.

The SWP coordinates K-12 place-based education through the Upper Great Lakes Stewardship Initiative (UGLSI), a regional hub of the Great Lakes Stewardship Initiative funded by the Great Lakes Fishery Trust with projects on lakes Superior and Michigan. Through this initiative, teachers and students from over a dozen 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 old growth forest, coastal wetlands, and undeveloped Lake Superior shoreline just outside of the Marquette City limits. 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

The forested parcel has been owned by the same local family since 1870. Involving the Marquette area community 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 Community Foundation of Marquette County, Marquette County Conservation District, Keweenaw Bay Indian Community, Northern Michigan University, the Upper Great Lakes Stewardship Initiative (UGLSI), and 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 *Outstanding 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 Marquette area K-12 and university students.

IMPLICATIONS OF CLIMATE CHANGE ON LANDSCAPE MANAGEMENT AT EAGLE'S NEST 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). The Climate Change Response Framework conducted a series of vulnerability assessments for the Northwoods region supported by 19 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 Northern

Figure 1.—The assessment area and the 41 counties used to approximate the Laurentian Mixed Forest Province when county-level data were required.

Wisconsin and the Western Upper Peninsula (including Marquette County): 1). Increased precipitation 2). Increased daily maximum temperatures, particularly in winter 3). Potential increase in mean annual temperature of 2 to 9 ºF for the region 4). The most vulnerable forest communities in the assessment area include upland spruce-fir, lowland conifers, aspen-birch, lowland-riparian hardwoods, and red pine forests (Janowiak 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 and federal guidance to protect and support wildlife, and specifically rare, threatened, and endangered species. 2). 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. 3). 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. 4). Adapt fire and fuel policies specific to land use in particular regions to address ecosystem and human health concerns exacerbated by drought conditions. 5). Adapt forest harvest and management practices for anticipated changes in tree species diversity related to heat-stress and tolerance levels. 6). Adapt forest harvest and management practices for shorter seasons of frozen ground and reduced harvest windows. 7). Manage forests using strategies for increasing carbon storage with enhanced regeneration, competition control, fertilization, and superior stock (Janowiak 2012). 8). Manage forests for non-timber products such as food, medicine, and craft. In addition, protect cultural, archeological and historical resources. 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 shift tourist and local recreational focus from winter-sports to warmer-weather activities. 11). Plan, adapt, and inform the public about regional increases in human diseases and vectors of transmission. 12). Plan, adapt to challenges and plant a variety of highly tolerant species at urban and community forest sites (Janowiak et al. 2014).

MANAGEMENT RECOMMENDATIONS

Long-term management and monitoring of the community forest will be conducted by the SWP. The 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 Marquette Township and Marquette County.

- 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 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 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 located adjacent to the parcel will provide a parking area and 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.

Upland areas including already established trails and an old railroad bed will be utilized for the establishment of new hiking trails. SWP's Great Lakes Conservation Corps (GLCC) crews and staff are trained in sustainable trail building techniques and will implement construction of public trails at appropriate locations throughout the community forest. Signs will be installed to limit foot traffic to established trails.

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EAGLE'S NEST COMMUNITY FOREST PHOTOS

Photo 1 View of sand beach from Lake Superior

Photo 2 Looking southeast at sand beach along Lake Superior

Photo 3 Road frontage along Eagle's Nest Road (old CR 550)

Photo 4 Example of old growth white pine

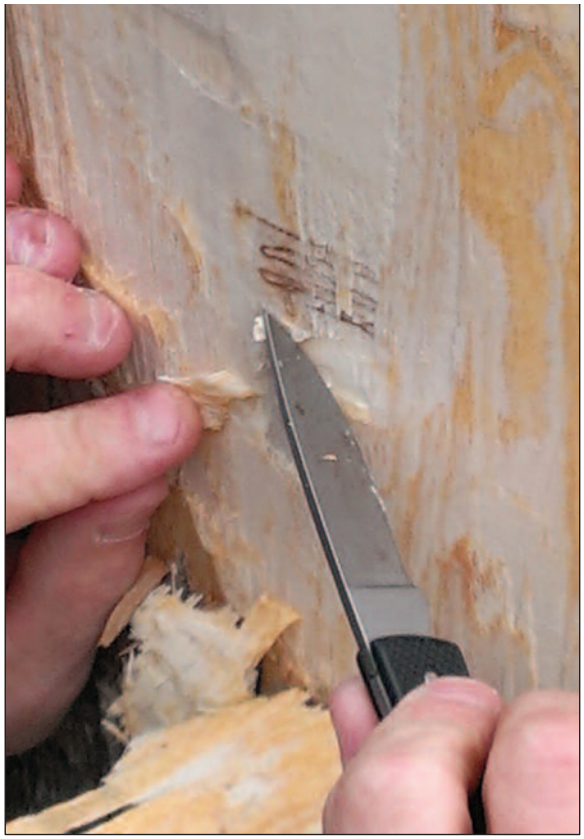

Photo 5 Emerald Ash Borer larvae

Photos 6 and 7 SWP Great Lakes Conservation Corps field crews