

Pretty Lakes Area ERA Plan

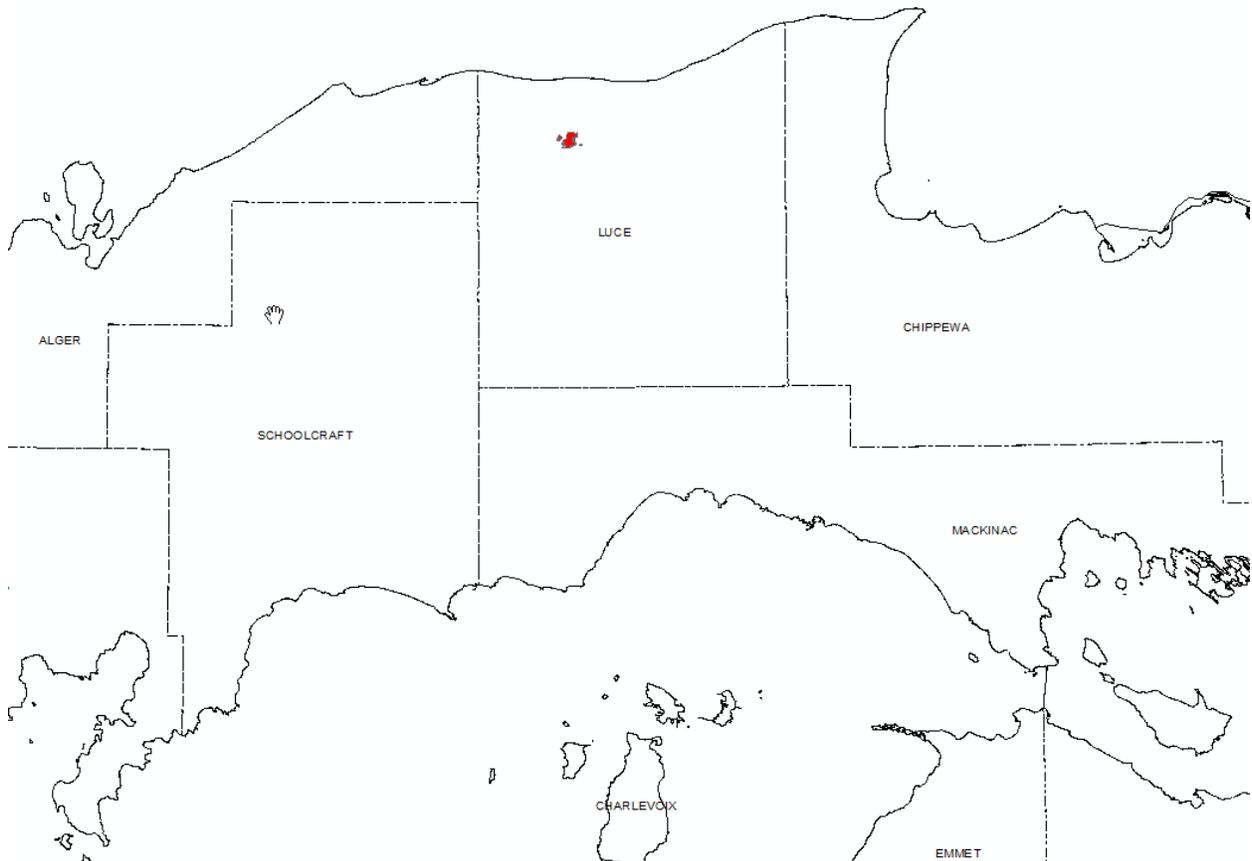


Figure 1. Location map for Pretty Lakes Area ERAs.

Administrative Information:

- This plan is for two dry-mesic northern forest (DMNF) ERAs, and one small patterned fen ERA in the Pretty Lakes area.
- The ERAs are within the Newberry FMU, Two Hearted Headwaters and Deer Park Management Areas (MA), Compartments 15, 20 and 21.
- Luce County, McMillan township. T49N, R11W, sections 32, 33, 34; and T48N, R11W, sections 2, 3 and 4.
- Primary plan author: Kristen Matson, Forest Resources Division (FRD) Inventory and Planning Specialist; Contributors and reviewers include Sherry MacKinnon, Wildlife Division (WLD) Wildlife Ecologist; Keith Kintigh, FRD Forest Certification and

Conservation Specialist; Kristie Sitar, WLD Wildlife Biologist; Keith Magnusson, FRD Unit Manager; Matt Payment, Amy Douglass, and Jason Tokar, FRD Foresters.

- To the north of these ERAs, ownership is state forest land. To the south, there are private parcels interspersed.
- Two-track roads are around the exterior, with a few roads in portions of the ERAs. The large Pretty Lakes Pinery ERA contains many lakes, camp sites and hiking trails.
- While there is not a Pretty Lakes Plan, the area has been managed as an unofficial “Quiet Area” for the past few decades. Timber harvesting has not occurred in this area since before 1967. The Newberry FMU maintains a “History of Pretty Lakes Area” that documents all communications and management actions regarding this area since 1972. The small Lake Strangmoor North Branch patterned fen ERA, that is also included in this plan, is within the Two-Hearted Natural River area. The following is the link to the Two-Hearted Natural River Plan:
http://www.michigan.gov/documents/dnr/Cover_preface_TOC_185048_7.pdf
- ERA boundaries are derived from the underlying Natural Community EO boundary which are mapped using NatureServe standards. EO Boundaries are informed by vegetation and other site characteristics including soils, landform, and/or historic aerial imagery. As a result, it is not uncommon for EO/ERA boundaries to differ from forest inventory stand boundaries. If these difference result in potential conflicts with proposed forest activities, consult with the Forest Conservation and Certification Specialist.

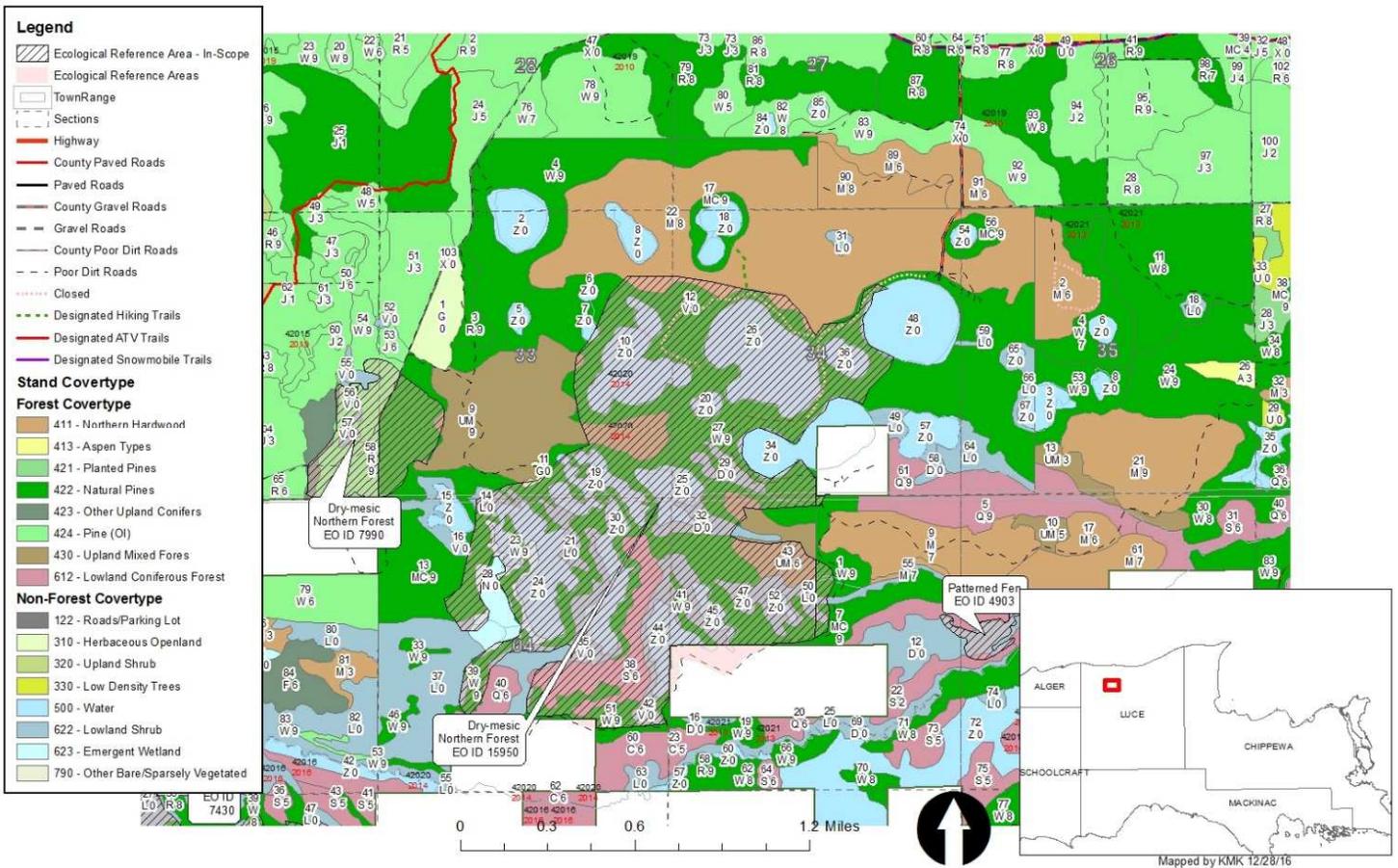


Figure 2. Pretty Lakes ERAs area map with EO ID labels.

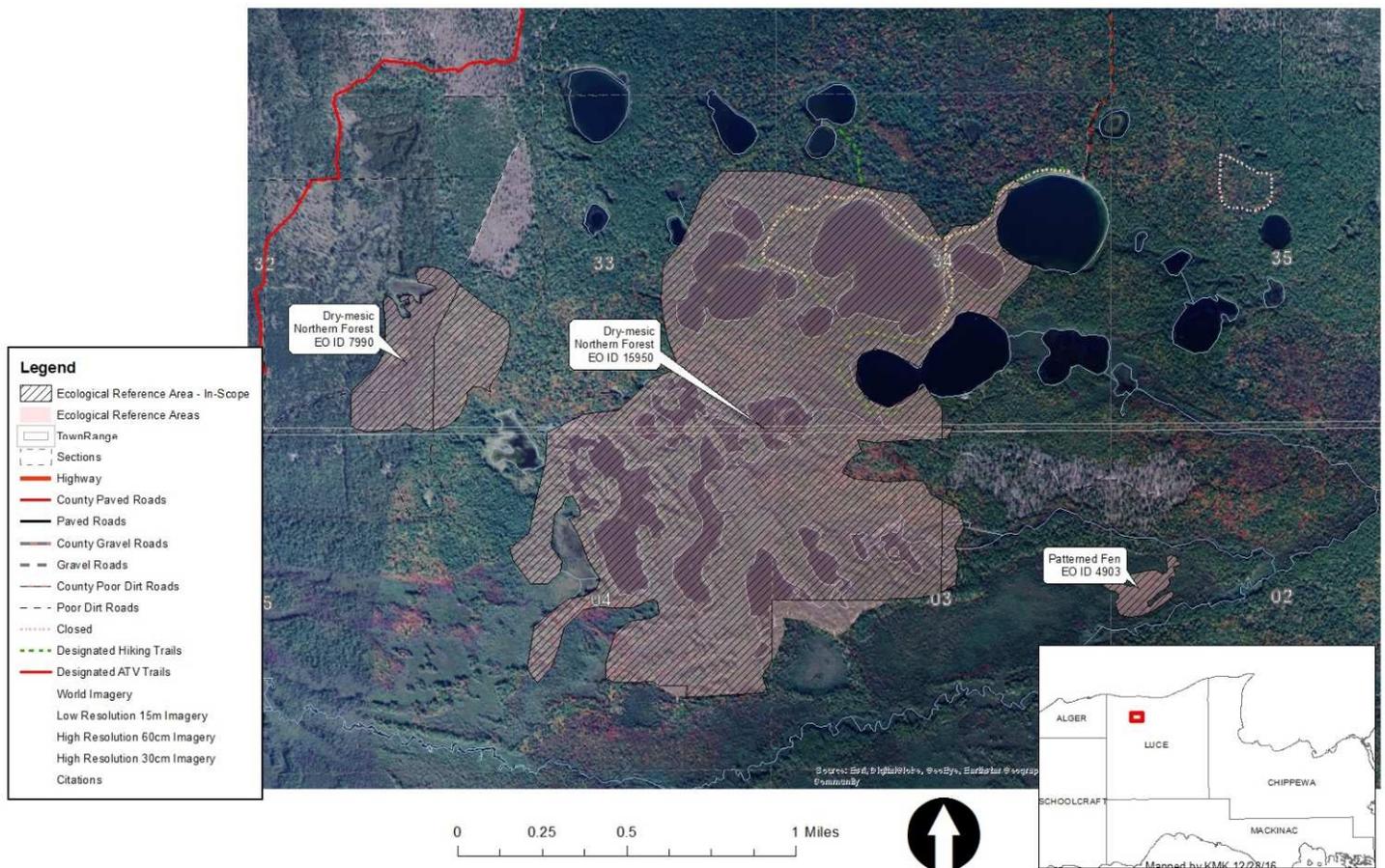


Figure 3. Pretty Lakes ERAs, imagery with EO ID labels.

Conservation Values

This ERA plan encompasses three individual ERAs found in close proximity to Pretty Lakes. There are two dry-mesic northern forest ERAs (Pretty Lakes Pinery and North Branch Lakes White Pines), and one patterned fen ERA (Lake Strangmoor North Branch).

Dry-mesic Northern Forest

Dry-mesic northern forests are pine or pine/hardwood dominated communities, principally occurring on sandy glacial outwash, sandy glacial lakeplains, and less often on inland dune ridges, coarse-textured moraines, and thin glacial drift over bedrock. Prior to settlement, it originated in the wake of catastrophic stand replacing fire, and was maintained by frequent, low intensity ground fires. Dry-mesic northern forests are typically dominated by white pine and/or red pine, with hemlock, red oak, white oak, black oak, beech, and red maple as common associates. Aspen components should be minor and declining, with recruitment of pine likely or already occurring. Older and larger diameter red and white pine and potentially hemlock should be present.

When the primary conservation objective is to maintain biodiversity in dry-mesic northern forests, the best management is to leave large tracts unharvested and encourage the operation of natural processes (fire, growth, senescence, windthrow, disease, insect infestation, etc.). Long-term preservation of dry-mesic northern forest communities depends on the promotion of fire as the prime ecological process driving persistence and establishment.

Dry-mesic northern forest is G4S3 rank, apparently secure globally and vulnerable within the state.

1. **Pretty Lakes Pinery** EO_ID 15950, AB rank, Last Observed 2002-08-23
Approximately 865 acres, AB rank excellent or good estimated viability.

This site is a naturally regenerated white pine (*Pinus strobus*) and red pine (*P. resinosa*) forest that is dominated by medium- to large-diameter trees (15-28") with 50-80% crown cover. The pine forest occurs on moderate inland dune ridges within acidic, sandy lakeplain dominated by peatlands and inland lakes. The soils are dune sands that are acidic (pH 4.5-5.0) and fine- to medium-textured with a 4 to 6 cm conifer needle mat overlying the mineral soil. Sands exhibit low to moderate water-retaining capacity. Some of the dune ridges in the southern portion of the occurrence are very steep. The pine ridges regenerated following a major fire approximately 90 to 100 years ago. Numerous charred snags and stumps of the preceding cohort were found throughout and cut stumps are infrequent and localized.

The canopy of mature red pine and white pine is over 90 years old and between 80 and 100 feet tall. Many of the snags are over 35" while the current canopy ranges in diameter from 15 to 28" (suggesting that these trees have the potential to grow significantly larger). Canopy associates include paper birch (*Betula papyrifera*), big-toothed aspen (*Populus grandidentata*), and red oak (*Quercus rubra*), and less frequently northern white-cedar (*Thuja occidentalis*), hemlock (*Tsuga canadensis*), and white spruce (*Picea glauca*). The subcanopy is dominated by balsam fir (*Abies balsamea*), black spruce (*Picea mariana*), paper birch, and red maple (*Acer rubrum*). The sparse tall shrub and sapling layer contains balsam fir, black spruce, red maple, white pine, and serviceberry (*Amelanchier interior*). The low shrub layer is dense with blueberries (*Vaccinium* spp.) dominant. The herbaceous layer is dominated by bracken fern (*Pteridium aquilinum*). Common herbaceous plants include wintergreen (*Gaultheria procumbens*), trailing arbutus (*Epigaea repens*), starflower

(*Trientalis borealis*), bunchberry (*Cornus canadensis*), goldthread (*Coptis trifolia*), Canada mayflower (*Maianthemum canadense*), and wild sarsaparilla (*Aralia nudicaulis*).



Figures 4 and 5. Pretty Lakes Pinery burned about 100 years ago, and occurs on sandy dune ridges surrounding lakes and peatlands. Photos by Joshua G. Cohen.



2. **North Branch Lakes White Pines** EO_ID 7990, BC rank, Last Observed 2007-07-27
Approximately 91 acres. BC rank, good or fair estimated viability.

This site is a mature, naturally regenerated pine forest occurring on flat sandy lakeplain with well-drained, acidic sandy soils. A thick needle mat (4-6 cm deep) overlays the acidic (pH 4.0-5.5) sands. Areas of forest along the margins of the bog depressions and poor conifer swamp are characterized by increased moisture availability as indicated by an increase in species diversity and density in these ecotonal areas. The current canopy cohort is approximately 100 years old, having regenerated following a catastrophic crown fire as indicated by the numerous large-diameter burnt snags occurring throughout. Mild pit and mound topography occurs throughout the site and indicates that small-scale gap dynamics (windthrow) is also an important natural disturbance factor influencing species composition, structure, and succession. Coarse woody debris is beginning to accumulate and is comprised primarily of small-diameter early-successional species, such as paper birch, quaking

aspen (*Populus tremuloides*), and balsam fir, but there are some scattered red pine (*Pinus resinosa*) and white pine (*Pinus strobus*) snags throughout.

The canopy cohort is dominated by white pine with areas co-dominated by red pine (15-24" DBH and 80-100 feet tall). Additional canopy associates include paper birch and quaking aspen; many of these early-successional trees are dying or are already snags. Subcanopy species include black spruce, balsam fir, paper birch, quaking aspen, red maple, and white spruce. Black spruce, red maple, and balsam fir are prevalent in the understory along with scattered white pine and localized patches of white pine and red pine regeneration (i.e. along the road margins and in windthrow gaps).

The low shrub layer is dominated by low sweet blueberry (*Vaccinium angustifolium*) and Canada blueberry (*V. myrtilloides*) along with red maple and serviceberry (*Amelanchier* sp.). The ground layer is dominated by bracken fern (*Pteridium aquilinum*). Additional ground layer species include red maple seedlings, wintergreen (*Gaultheria procumbens*), trailing arbutus (*Epigaea repens*), starflower (*Trientalis borealis*), bunchberry (*Cornus canadensis*), and Canada mayflower (*Maianthemum canadense*). Areas with open canopy (50-75% canopy closure) are characterized by a prevalence of lichens (*Cladonia* spp.). The margins of bog depressions typically support a denser understory and a low shrub layer with leatherleaf (*Chamaedaphne calyculata*) and Labrador tea (*Ledum groenlandicum*), and black spruce, red maple, and wild-raisin (*Viburnum cassinoides*), common in the tall shrub layer.



Figure 6. Photo by Joshua G. Cohen

Patterned Fen

Patterned fens are prominent features in the boreal and sub-boreal regions of North America, Europe, and Siberia. This natural community reaches its southern extent in the Great Lakes States of Minnesota, Wisconsin, and Michigan. Patterned fen is a minerotrophic shrub- and herb-dominated peatland mosaic characterized by a series of peat ridges (strings) and hollows (flarks) oriented parallel to the slope of the landform and perpendicular to the flow of groundwater. The strings vary in height, width, and spacing, but are generally less than one meter tall, resulting in a faint wave-like pattern that may be discernable only from aerial photographs. The flarks are saturated to inundated open lawns of sphagnum mosses, sedges, and rushes, while the strings are dominated by sedges, shrubs, and scattered, stunted trees. Patterned fens occur in the eastern Upper Peninsula, with the highest concentration found in Schoolcraft County. Patterned fens are also referred to as patterned bogs, patterned peatlands, strangmoor, Aapa mires, and string bogs. Long-term persistence of patterned fen is dependent upon intact hydrology.

Lake Strangmoor North Branch EO_ID 4903, C rank, Last Observed 1983-08-17, modified and ranked 2005-04-06.

Approximately 13 acres. C rank fair estimated viability.

This ERA is small, with low diversity and poorly developed patterning. It is moist fibric sedge peat, and is pH 6.0. There were 25 species noted during the survey, including: black chokeberry (*Aronia melanocarpa*), and sparse bog birch (*Betula pumila*) on strings. There are scattered sphagnum hummocks, and occasional small islands of larch, spruce and cedar. The site has a dense herbaceous cover, with other layers scattered to very sparse.

This area consists of low strings and shallow flarks in a more extensive sedge fen. The slopes are extremely gradual to the ENE. The water table is currently low. Charred stumps were seen during the survey.

This ERA is between a stream flowing out of the North Branch Lakes, the North Branch of the Two-Hearted River and low wetland cover types. The area is naturally protected because of difficult access and remote location.

High Conservation Value (HCV) Attributes:

The Pretty Lakes landscape is part of a very large system, with excellent landscape context. Pine ridges are surrounded by high quality wetlands (bogs, intermittent wetlands, and poor fens), and adjacent to numerous inland lakes. The landscape is unfragmented, and has very low road densities and minimal anthropogenic disturbance (primarily logging on private lands to the south).

In addition to the ERAs in this plan, the whole Pretty Lakes area is part of a Dedicated Habitat Area (DHA) for core interior forest. The area contains verified type 2 old growth.

The Lake Strangmoor North Branch patterned fen ERA is within the Two Hearted River Natural Area vegetative buffer zone High Conservation Value Area (HCVA). This Natural River zone extends along the southern edge of the Pretty Lakes ERA and DHA. The Two Hearted River is also a high priority trout stream Special Conservation Area (SCA).

Loons have been found in Pretty Lakes, and annually nest in the Pretty Lakes complex. The area has potential habitat for nesting merlin, goshawk, osprey and eagle. Campgrounds and hiking trails are around some of the lakes.

There have not been any treatments within the Pretty Lakes area for the past 50+ years. There are no cutting records in any of the historical files at the Newberry Field Office. The last references to cutting were mostly verbal from past DNR staff saying that some cutting occurred

in this area during a period between 1957-1967. In 1974, there was a formal adoption of local watercraft controls on the various small lakes in this area, and motorized boat regulations are enforced. In the late 1970's and early 1980's, Directors Orders were signed to close some of the roads in the area, to limit vehicle traffic thus maintaining the "quiet" character of the area.

Threats Assessment

Dry-mesic Northern Forest

Current threats to dry-mesic northern forest in this area are nearby logging and fire suppression. Few invasive species are presently established in most exemplary dry-mesic northern forest, but are a potential future threat. Monitoring to detect invasive plants along established trails and roads or new temporary roads, and implementing control measures to remove invasive species before they become well established is critical to the long-term viability of the community.

Patterned Fen

Currently, fens are threatened by peat mining, logging, quarrying, agricultural runoff and nutrient enrichment, draining, flooding, off-road vehicle (ORV) activity, and development (Bedford and Godwin 2003). A major threat to patterned fen is hydrologic alteration through ditching, damming, logging, establishment of fire lines, and trail- and road-building activities, which can result in significant changes to peatland composition and structure.

General Management of ERAs

ERAs will generally not be managed for timber harvest. Management activities or prescriptions in Ecological Reference Areas are limited to low impact activities compatible with the defined attributes and values of the community type, except under the following circumstances:

- i. Harvesting activities where necessary to restore or recreate conditions to meet the objectives of the ERA, or to mitigate conditions that interfere with achieving the ERA objectives. In this regard, forest management activities (including timber harvest) may be used to create and maintain conditions that emulate an intact, mature forest or other successional phases that may be under-represented in the landscape.

ii. Road building only where it is documented that it will contribute to minimizing the overall environmental impacts within the FMU and will not jeopardize the purpose for which the ERA was designated.

iii. Existing and new land use activities should be evaluated in the context of whether they detract from achieving the desired future conditions of the natural community for which the ERA was designated. The acceptability of land use activities within DNR administered ERAs will be evaluated using severity, scope, and irreversibility criteria, as established in DNR IC4199, Guidance for Land Use Activities within DNR Administered Ecological Reference Areas.

iv. Threats such as fire, natural or exotic pests or pathogens may warrant other management measures.

v. Harvesting and other management activities in presently accessible areas located within the peripheral boundary of an ERA that are NOT the natural community of focus and which may or may not be typed as a separate stand or forest type (e.g. an upland island of previously managed aspen within a bog complex) may be prescribed for treatments, contingent upon a determination of no anticipated direct or indirect adverse impact to the defined attributes and values of natural community for which the ERA was designated. The FRD Biodiversity Conservation Program leader shall be consulted regarding the determination of any direct or indirect adverse impact.

vi. Land management activities immediately adjacent to an ERA should consider any anticipated direct or indirect adverse impact to the defined attributes and values of natural community for which the ERA was designated. Management will be adaptive. ERAs will be monitored to determine if implemented management activities are moving the natural communities forward, or maintaining them at their desired future condition. The network of ERAs will be evaluated every five years for their contribution to the overall goal of biodiversity conservation. This review cycle will allow for the potential addition or subtraction of lands from an ERA, designation of new ERAs, or removal of the ERA planning designation.

Management Goals

- Restoration of and/or expansion of the ERAs where applicable.
- Invasive Species: Ideally, the best goal would be to eliminate invasive species (or maintain an absence of invasive species), but in some areas, that may not be possible and a goal that recognizes this may be necessary.
- The ERA has representation of native plants, indicator species, and rare species.

- Reduce fragmentation.
- Reduce other threats.
- Allow natural processes to occur (fire, windthrow, insect epidemics).

Management Objectives

The following Management Objectives describe the measures necessary to ensure the maintenance and/or enhancement of the ERA site or sites. Objectives and associated management actions will be prioritized and implemented based upon available resources.

- Identify and prioritize critical areas within the ERA to treat for invasive species.
- High diversity of native plants is desirable.
- Allow blowdown/windthrow, fire, and insect mortality to occur without salvage harvest.
- Assess forest regeneration within the planning period.
- Assess EO quality every 10-20 years.
- Work with adaptation specialist to determine threats associated with climate change.
- Identify and eliminate illegal ORV access points.
- Determine if there are impacts to hydrological system.

Management Actions

Suggested actions or series of actions that would help to achieve the above objectives.

(M= Maintenance action, R= Restoration action)

For all ERAs in this plan:

- If current data/knowledge are not available regarding the management goals, actions may address needed assessments (i.e. surveys may be needed). (M, R)
- Identify vectors of invasive species and reduce their introduction to the site. (M, R)
- Remove invasive plants using appropriate control methods for that particular species (hand-pull, herbicide, prescribed burn). (M, R)
- Minimal Impact Suppression Tactic (MIST) practices should be used for wildfire response in this area if possible. (M, R)
- Close illegal roads and trails. (M, R)
- Install culverts if necessary to restore natural hydrological flow. (R)
- Work with MNFI and other experts to update EO inventory. (M, R)
- Update plan with additional knowledge as it becomes available. (M)

For DMNF ERAs:

- Maintain natural plant species. (R)
- If applicable, use periodic burning to maintain presence of native plant species, reduce invasives, and to reduce woody encroachment. (M, R)
 - Summer burning should be employed to simulate naturally occurring lightning season burns.
- Where forest regeneration is found to be inadequate west of the road: (R)
 - For restoration purposes if prescribed fire is not possible, mechanical removal of trees and scarification may be used to mimic stand replacing fires which would occur on a 120 to 300-year interval.

For Patterned Fen ERA:

- If applicable, use periodic burning to maintain presence of native plant species, reduce invasives, and to reduce woody encroachment. (M, R)
- Rehabilitate fire lines as applicable. (R)
- Maintain a minimum of 100-foot buffer in uplands adjacent to patterned fen ERA; avoid final harvests in stands immediately adjacent to the ERA. (M, R)
- Avoid creating new roads immediately adjacent to ERA. (M, R)
- To reduce woody encroachment in patterned fen ERA, selective cutting can occur in winter using techniques to avoid impacting hydrology. (R)
- Work with LED to increase patrols for illegal ORV activity and enforce state land use rules. (M, R)

Monitoring

Monitoring approaches and indicators appropriate for the natural community and in line with the objectives and management actions suggested, including appropriate frequency and timing considerations. (Unless otherwise specified, monitoring is expected to occur once every 10-year inventory cycle)

Metric	Current Status	Desired Future Status	Assessment
Representative and rare species – species occurrences	Baseline EO Records; updated when EO's are updated	No decreases	TBD
Presence/Absence of trees >120 years old	Baseline inventory data taken every decade	Increasing in age	TBD
Forest Regeneration – regeneration by species	Baseline inventory data taken every decade	Regeneration falls within acceptable ranges by species	TBD
Populations of invasive species – number and scope of species	Severity unknown; treatments should be monitored appropriately; detection monitoring opportunistically or every five years' maximum	Eliminated/fewer occurrences	
Illegal ORV activity – number of new instances and number of citations issued	Moderate; monitored via patrols, reports or opportunistically	Eliminated/fewer occurrences	TBD
Change in EO rank	Various – see above	No decrease	TBD

Additional Resources:

MNFI Natural Community Abstracts: <http://mnfi.anr.msu.edu/pub/abstracts.cfm#Communities>

Michigan Department of Natural Resources Forest Certification Work Instruction 1.4:
http://www.michigan.gov/documents/dnr/WI_1.4BiodMgt_320943_7.pdf