

Shingleton Northern Wet Meadow, Northern Shrub Thicket and Poor Fen ERA Plan

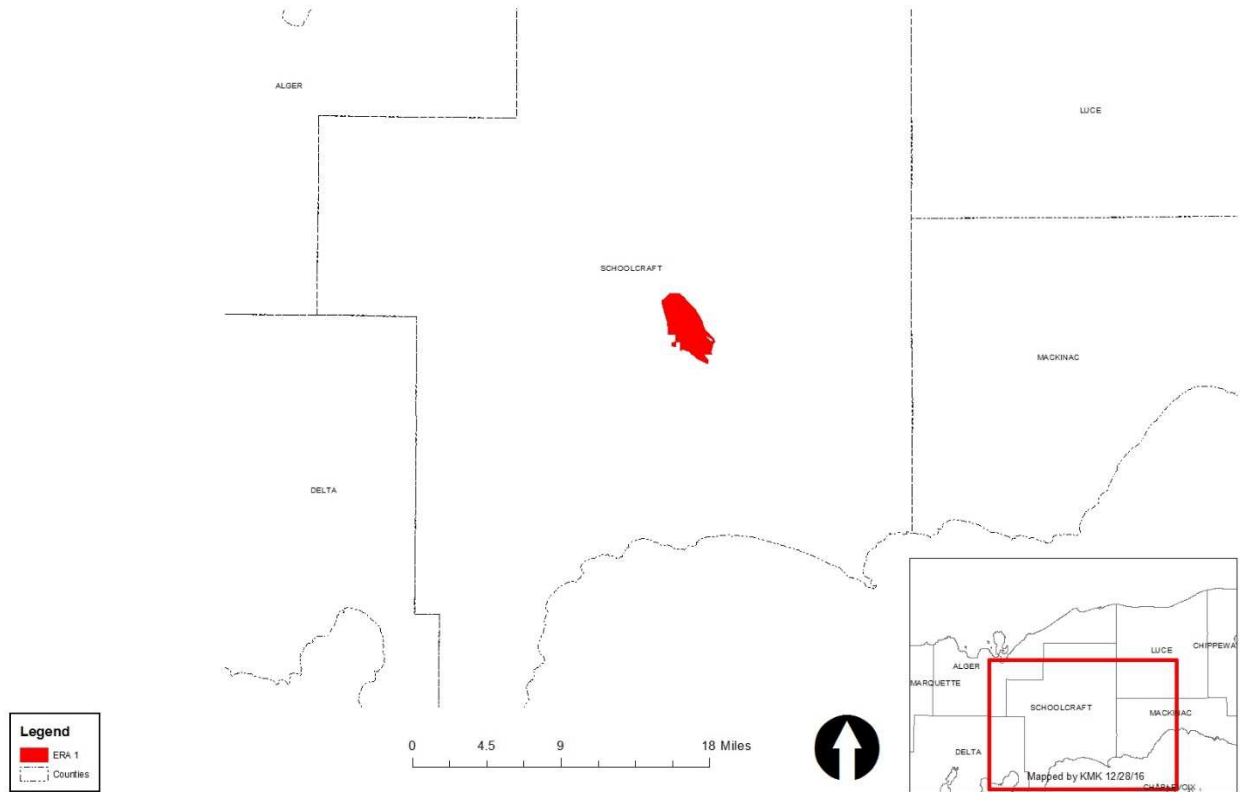


Figure 1. Shingleton Northern Wet Meadow, Northern Shrub Thicket and Poor Fen ERA plan locator map.

Administrative Information:

- The Shingleton Northern Wet Meadow (NWM), Northern Shrub Thicket (NST) and Poor Fen ERA Plan contains three adjacent ERAs, one of each of the natural communities listed.
- These ERA's are located on State Forest land in the Shingleton FMU, in Schoolcraft County, in compartments 32, 49, 50, 53.
- The Creighton Marsh Northern Wet Meadow, Northern Shrub Thicket and Poor Fen ERAs are within the Seney Manistique Swamp Management Area (MA).
- Schoolcraft County, Manistique Township, T44N R15W sections 26-28, and 33-36; T43N R15W sections 1-3, 10-12, 13, and 14; and Doyle Township T43N R14W section 7.

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- State of Michigan land surrounds the ERAs on the north and south, with private ownership to the west, and the Seney National Wildlife Refuge to the northeast.
- There are no existing infrastructure/facilities within these ERAs. A snowmobile trail is to the east.
- 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 to request a boundary evaluation by Michigan Natural Features Inventory.

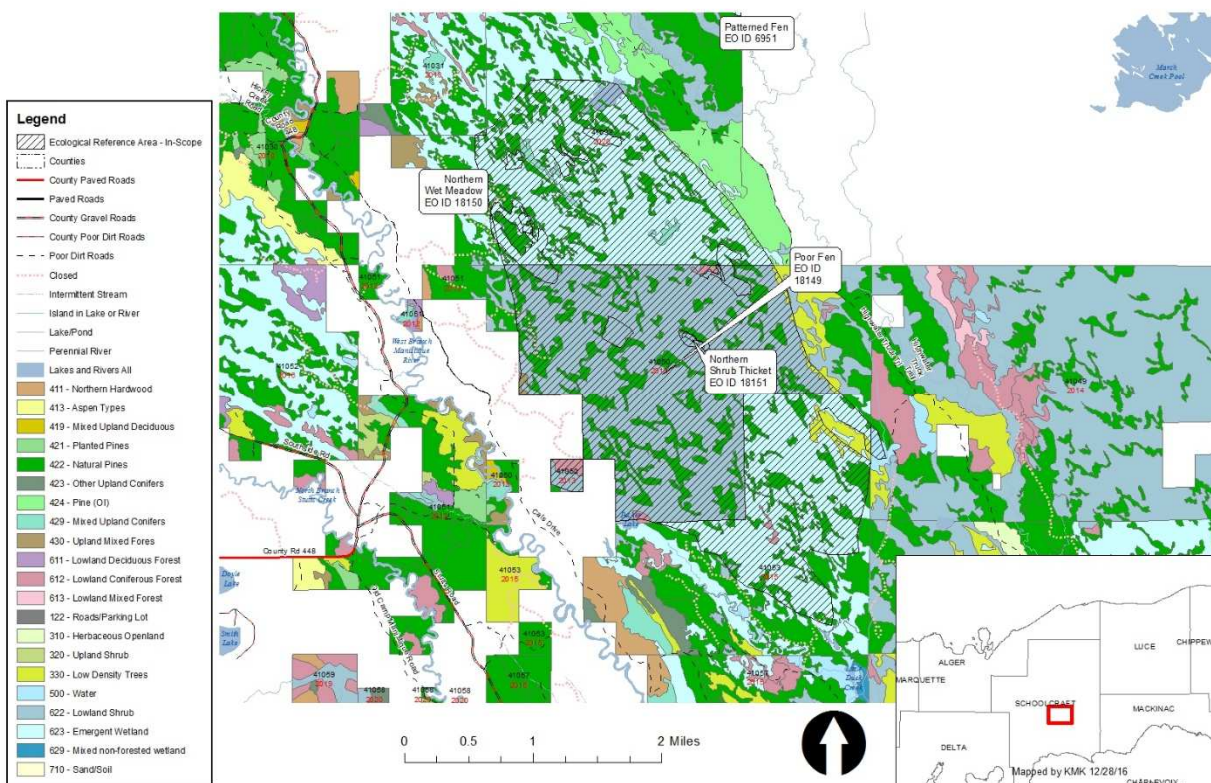


Figure 2. Shingleton Northern Wet Meadow, Northern Shrub Thicket and Poor Fen ERA area map with EO ID labels. (Patterned Fen ERA is in the Shingleton Patterned Fen ERA plan.)

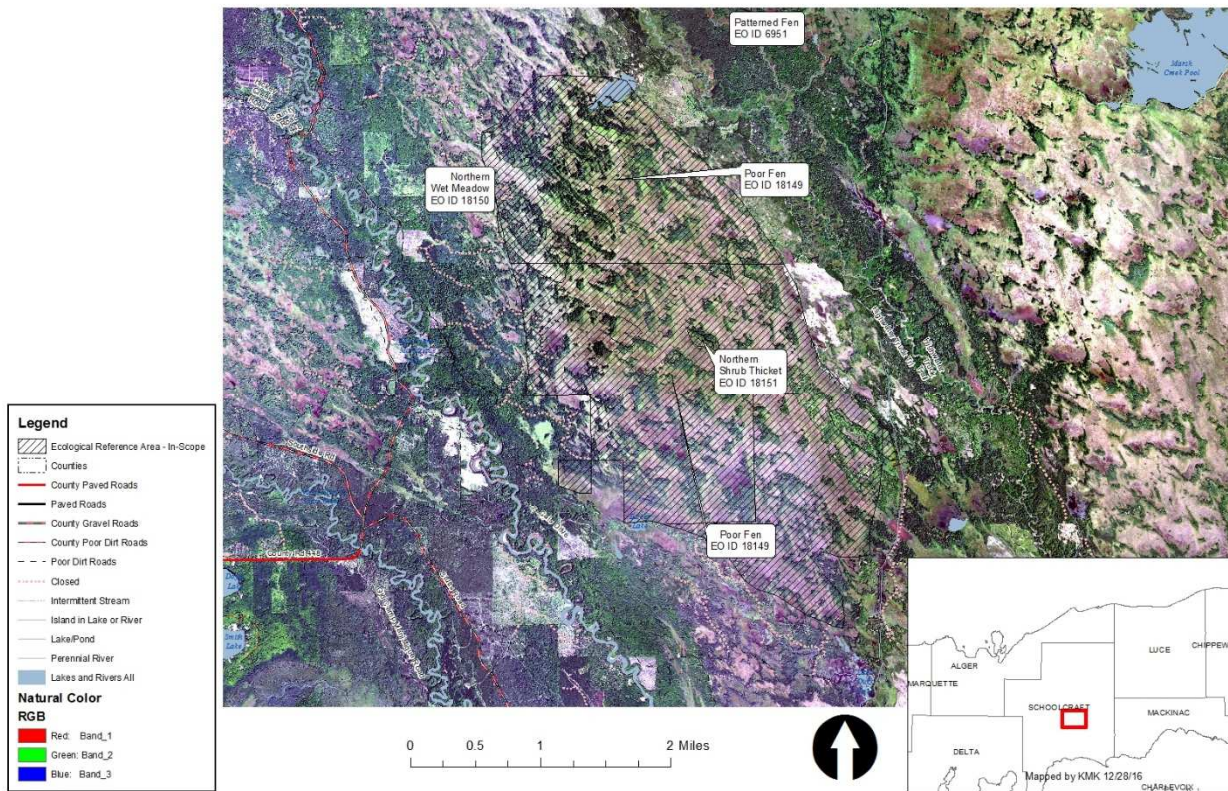


Figure 3. Shingleton Northern Wet Meadow, Northern Shrub Thicket and Poor Fen ERA Imagery with EO ID labels. (Patterned Fen ERA is in the Shingleton Patterned Fen ERA plan.)

Conservation Values

There are three ERAs in three different natural communities in this area:

1. Northern Wet Meadow (G4G5 S4):

Northern wet meadow is an open, groundwater-influenced, sedge- and grass-dominated wetland that occurs in the northern Lower and Upper Peninsulas and typically borders streams but is also found on pond and lake margins and above beaver dams. Soils are nearly always sapric peat and range from strongly acid to neutral in pH. Open conditions are maintained by seasonal flooding, beaver-induced flooding, and fire.

Northern wet meadow occurs on glacial lakebeds, in channels of glacial outwash, and in depressions on glacial outwash and moraines. The community frequently occurs along the margins of lakes, ponds, and streams where seasonal flooding or beaver-induced flooding is common. Northern wet meadow is regularly found adjacent to other wetland communities, often in large wetland complexes. Along streams, northern wet meadow typically borders northern shrub thicket and swamp forest. On the edges of

inland lakes, northern wet meadow often borders emergent marsh and less frequently northern fen.

ERA's for high-quality northern wet meadows are best conserved in conjunction with associated high-quality wetland and upland communities and have a wide variety of native herbaceous plant species.

Creighton Marsh Northern Wet Meadow, EO_ID: 18150, LASTOBS: 2010-09-01

EO Rank AB, excellent or good estimated viability, on 191 acres of state forest land.

Creighton Marsh NWM occurs on poorly drained lakeplain within a large wetland complex. The site is shaped by natural processes and is influenced by seasonal flooding and periodic flooding from beaver activity. Sedge (*Carex*) hummocks throughout the complex provide micro-topography and fine-scale gradients in soil moisture and chemistry. This northern wet meadow occurs intergrading with poor fen and northern shrub thicket.

Creighton Marsh NWM is a complex unfragmented landscape on poorly drained sand lakeplain. The soils are characterized by slightly acidic (pH 6.0-6.8) peats of variable depth (10-70cm) overlying wet coarse-textured slightly acidic to circumneutral (pH 6.5-7.0) sands. It contains a diverse array of high-quality communities that occur in the surrounding area. Areas of poorly drained lakeplain support high-quality northern shrub thicket, poor fen, muskeg, poor conifer swamp, and northern wet meadow. Dune ridges within the lakeplain support dry northern forest and dry-mesic northern forest, much of which has been managed. The site occurs within a state forest managed for timber production, recreation, and biodiversity.

No non-native plants were noted during the course of the survey. Logging in nearby uplands has likely locally influenced the hydrology and logging vehicles have caused rutting in portions of northern wet meadow.

2. Northern Shrub Thicket (G4 S5):

A shrub-dominated wetland located north of the climatic tension zone, typically occurring along streams, but also adjacent to lakes and beaver floodings. The saturated, nutrient-rich, organic soils are composed of sapric peat or less frequently mineral soil, typically with medium acid to neutral pH. Succession to closed-canopy swamp forest is slowed by fluctuating water tables, beaver flooding, and windthrow. Northern shrub thickets are overwhelmingly dominated by tag alder (*Alnus rugosa*). Generally,

occurrences on poorly drained, level outwash plains and lakeplains are larger than those associated with narrow outwash channels and stream corridors.

Creighton Marsh Northern Shrub Thicket, EO_ID: 18151, LASTOBS: 2010-09-01

EO Rank AB, excellent or good estimated viability, on 19 acres of state forest land.

Creighton Marsh northern shrub thicket occurs on poorly drained lakeplain within a large wetland complex. Northern shrub thicket influenced by seasonal inundation. Sedge (*Carex*) hummocks throughout the complex provide micro-topography and fine-scale gradients in soil moisture and chemistry. The soils are characterized by shallow (10-20cm) acidic (pH 6.0) peats overlying wet, coarse-textured slightly acidic sands (pH 6.5). The site is shaped by natural processes and is buffered by extensive wetlands and unfragmented forests.

No anthropogenic disturbances or non-native plants were noted during the course of the survey. Logging in nearby uplands has likely locally influenced the hydrology and logging vehicles have caused rutting in portions of northern wet meadow. Complex unfragmented landscape on poorly drained sand lakeplain. Diverse array of high-quality communities occur in the surrounding area. Areas of poorly drained lakeplain support high-quality northern shrub thicket, poor fen, muskeg, poor conifer swamp, and northern wet meadow. Dune ridges within the lakeplain support dry northern forest and dry-mesic northern forest, much of which has been managed. The northern shrub thicket intergrades with northern wet meadow. Bog birch (*Betula pumila*) is locally dominant and these areas of shrub thicket tend to be more open than the Speckled alder (*Alnus rugosa*) dominated areas. The site occurs within a state forest managed for timber production, recreation, and biodiversity.

3. Poor Fen (G3 S3):

Poor fen is a sedge-dominated wetland found on very strongly to strongly acidic, saturated peat that is moderately influenced by groundwater. The community occurs north of the climatic tension zone in kettle depressions and in flat areas or mild depressions on glacial outwash and glacial lakeplain.

Poor fen occurs in flat areas and shallow depressions on sandy glacial outwash and glacial lakeplain, and in kettle depressions on pitted outwash and moraines. Poor fens occur adjacent to other peatland communities, often grading into bog, poor conifer swamp, and muskeg. More minerotrophic systems such as northern fen, northern shrub thicket, northern wet meadow, and rich conifer swamp can occur along the outer margins of poor fens where groundwater seepage from adjacent uplands is prevalent.

Upland community types neighboring poor fen typically include fire-adapted communities such as pine barrens, dry northern forest, and dry-mesic northern forest.

Creighton Marsh Poor Fen, EO_ID: 18149, LASTOBS: 2010-09-01

EO Rank AB, excellent or good estimated viability, on 4,594 acres of state owned land.

The Creighton Marsh poor fen occurs on water tracks within poorly drained, flat lakeplain. The soils are characterized by slightly acidic (pH 6.5-6.8) saturated to inundated peats of variable depth (50-80cm) overlying wet medium textured sands. The poor fen, part of a large wetland complex, grades to northern wet meadow and northern shrub thicket in portions of the wetland. Poor fens are weakly minerotrophic peatlands, receiving inputs of water and nutrients from both ion-poor precipitation and low exposure to nutrient-rich groundwater.

Sphagnum hummocks and hollows generate fine-scale gradients in soil moisture and chemistry. The scattered conifers (tamarack, spruce, white and jack pine) and patchy shrubs (bog birch, alder and willow) are concentrated on the sphagnum hummocks. Numerous animal trails pass through the fen and create additional structural diversity by creating linear features with level and inundated conditions. The site is shaped by natural processes and is buffered by extensive wetlands and unfragmented forests. There is evidence of fire throughout surrounding landscape, and this poor fen and the surrounding wetlands and pine ridges have likely burned numerous times.

A diverse array of high-quality communities occur in the surrounding area. Areas of poorly drained lakeplain support high-quality northern shrub thicket, poor fen, muskeg, poor conifer swamp, and northern wet meadow. Dune ridges within the lakeplain support dry northern forest and dry-mesic northern forest, much of which has been managed. Poor fen occurs within water tracks and intergrades with northern wet meadow and northern shrub thicket. The site occurs within a state forest managed for timber production, recreation, and biodiversity. The site is shaped by natural processes and is buffered by additional wetlands and unfragmented forests. No non-native plants were noted during the course of the survey. Logging in nearby uplands has likely locally influenced the hydrology and logging vehicles have caused rutting in portions of northern wet meadow.

Management Recommendations: The main management recommendations are to allow natural processes (i.e., beaver flooding and wildfire) to operate unhindered and to retain an intact buffer of natural communities surrounding the wetland. Avoid

harvesting upland inclusions within wetlands. If these uplands are harvested, should be winter cut and vehicular traffic through wetlands should be avoided.

High Conservation Value (HCV) Attributes:

The Creighton Marsh landscape, in general, is largely an intact and functional landscape. It is part of a large landscape level forest with minimal road density and management activity.

The Creighton Marsh ERAs are south of a large patterned fen ERA (Shingleton Patterned Fen ERA plan). Wood turtle (*Glyptemys insculpta*) is identified in the southwest portion of the ERA close to the West Branch Manistique River.

Threats Assessment

Northern Wet Meadow:

The hydrology of these systems is threatened by stream channelization and reductions in local water tables as a result of excessive groundwater withdrawals and ditching. Lowering of the water table has caused the conversion of many sedge meadows to shrub thickets. In addition, fire suppression has allowed shrub encroachment with many sedge meadows converting to shrub thicket within ten to twenty years. In addition to shrub encroachment, alteration of the fire and hydrologic regimes has allowed for the invasion of sedge meadows by pernicious non-native species. Invasive species that pose a threat to the diversity and community structure of northern wet meadow include glossy buckthorn (*Rhamnus frangula*), purple loosestrife (*Lythrum salicaria*), narrow-leaved cat-tail (*Typha angustifolia*), hybrid cat-tail (*Typha xglauca*), reed (*Phragmites australis*), reed canary grass (*Phalaris arundinacea*), common buckthorn (*Rhamnus cathartica*), and multiflora rose (*Rosa multiflora*).

Northern Shrub Thicket:

Northern shrub thickets in the Upper Peninsula are threatened specifically by invasions of glossy buckthorn. Management should strive to prevent the further spread of invasive species and implement control measures when possible. Restoration of degraded northern shrub thicket wetlands depends on the occurrence of water-saturated peat and muck soils, maintaining water levels very near the soil surface throughout the year, providing protection from invasive species, and the availability of appropriate seed stock.

Monitoring and control efforts to detect and remove invasive species are critical to the long-term viability of northern shrub thicket and associated wetlands. Particularly aggressive invasive species that threaten the diversity and community structure include

glossy buckthorn, multiflora rose, purple loosestrife, narrow-leaved cat-tail, hybrid cat-tail, reed canary grass, and reed (*Phragmites australis*).

Poor Fen:

Documented threats are from off-road vehicle (ORV) traffic which can destroy populations of sensitive species and significantly alter fen hydrology through rutting. Reducing access to peatland systems will help decrease detrimental impacts. Increased surface water inputs and reductions in groundwater recharge can be prevented by avoiding road construction and complete canopy removal in stands immediately adjacent to fens. Where shrub and tree encroachment threaten to convert open wetlands to shrub-dominated systems or forested swamps, prescribed fire or selective cutting can be employed to maintain open conditions. Employ silvicultural management of poor fens to preserve open canopy during the winter to minimize damage to the peat and impacts to the hydrologic regime.

Hydrology and water chemistry is threatened by upland development, road building, ORVs, quarrying, peat mining, creation of drainage ditches and dams, agricultural runoff and nutrient enrichment, or runoff from logging. Fen vegetation is extremely sensitive to minor changes in water levels, water chemistry, groundwater flow, and nutrient availability. A reduction in groundwater flow and subsequent decrease in nutrients in poor fens can result in the shift to less minerotrophic wetlands such as bog. Lowered water tables from drainage allow tree and shrub encroachment into open fens and the eventual succession to closed-canopy peatlands. Conversion to more eutrophic wetlands has occurred as the result of nutrient enrichment and raised water levels, which cause increased decomposition of peat soils. Eutrophication from pollution and altered hydrology has detrimentally impacted fens by generating conditions favorable for invasive species.

Monitoring to detect and implementing control of invasive species are critical to the long-term viability of poor fen. Particularly aggressive invasive species that may threaten the diversity and community structure of poor fen include purple loosestrife, narrow-leaved cat-tail, hybrid cat-tail, reed, reed canary grass, European marsh thistle (*Cirsium palustre*), glossy buckthorn, and multiflora rose. Reducing well established populations of invasive plants typically requires long-term commitments by managers to repeatedly apply control treatments, over multiple years, and carryout sustained monitoring efforts. The use of herbicides in controlling invasive species can be very effective, while cultural treatments such as pulling, mowing, and cutting by themselves generally have poor results.

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

Goals and resulting management objectives to achieve those goals should address the following issues of importance to the specific site.

Northern Wet Meadow, Northern Shrub Thicket and Poor Fen:

- Restoration of ERA where applicable.
- The ERA has representation of native plants, indicator species, and rare species.

Northern Wet Meadow and Poor Fen:

- 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.
- Reduce other Threats (hydrology, Encroachment of Woody Vegetation, ORVs, etc.).
- Allow natural processes to occur.

Northern Shrub Thicket:

- Manage to eliminate current and prevent new invasive species occurrences.
- Reduce other Threats (Encroachment of Woody Vegetation).

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 actions will be prioritized and implemented based upon available resources.

For Northern Wet Meadow, Northern Shrub Thicket and Poor Fen:

- Work with adaptation specialist to determine threats associated with climate change.
- Identify and prioritize critical areas within the ERA to treat for invasive species.
- Assess EO quality every 10-20 years.
- Determine if there are impacts to hydrological system.

For Northern Wet Meadow and Poor Fen:

- Identify and eliminate illegal ORV access points.

- Work with local landowners to manage northern wet meadow on private property directly adjacent to ERA.

Management Actions

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

M= Maintenance action, R= Restoration action)

For Northern Wet Meadow, Northern Shrub Thicket and Poor Fen:

- 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) using partnerships where appropriate, develop FTP's and PAP's. (M, R)
- Follow BMP Riparian Zone Management (RMZ) guidelines related to lake, stream, pond or open water wetlands, which require a minimum zone width of 100 feet. Proposed activity including timber management within RMZs adjacent to ERAs should be evaluated on a case-by-case basis and are/may be acceptable where there is minimal risk of soil disturbance and sedimentation, and minimal risk of negatively impacting ERA quality.
- Follow BMP guidance for fens, bogs, and other rare wetland types. Harvest activity immediately adjacent to fens, bogs, and other rare wetlands may encounter weak soils that are highly susceptible to rutting. When timber harvesting occurs adjacent to these features, ground and vegetation disturbance within the wetland area should be avoided. To prevent sedimentation or excessive nutrient delivery into a rare wetland, timber harvests should be avoided along slopes immediately above and leading into a rare wetland [2018 BMP Manual pg. 16].
- Close illegal roads and trails. (M, R)
- Work with MNFI and other experts to update EO inventory. (M, R)
- Update plan with additional knowledge as it becomes available. (M)

For Northern Wet Meadow and Poor Fen:

- Use periodic burning to maintain presence of native plant species, reduce invasives, and to reduce woody encroachment. (M, R)
- To reduce woody encroachment selective cutting can occur in winter using techniques to avoid impacting hydrology.
- Minimal Impact Suppression Tactic (MIST) practices should be used for wildfire response when practical and commensurate with values at risk. (M, R)
- Avoid creating new roads adjacent to ERA.

- Install culverts under roads as needed and ensure that current culverts are functioning.
- Work with LED to increase patrols for illegal ORV activity and enforce state land use rules. (M, R)

For Northern Shrub Thicket:

- To control succession, remove overstory trees and scarify/burn site to encourage alder regeneration. (M, R)
- Work with local road commissions to remove or replace culverts as necessary to reduce excessive water inputs from drainage ditches. (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
Changes in EO rank	See above	No decrease	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	TBD
Illegal ORV activity – number of new instances and number of citations issued	Moderate; monitored via patrols, reports or opportunistically	Eliminated/fewer occurrences	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