

Michigan Department of Natural Resources, Forest, Mineral & Fire Management Division
**HIGH CONSERVATION VALUE AREA (HCVA) AND ECOLOGICAL REFERENCE AREA (ERA)
MANAGEMENT AND MONITORING FORMS PACKET**

Portions of this information are exempt from Michigan's Freedom of Information Act, 1976 PA 442, MCL 15.243



BACKGROUND AND INSTRUCTIONS

Prior to using this packet material and forms please refer to Work Instruction 1.4 Biodiversity Management on State Forestlands and the Conservation Area Management Guidelines available on line at:

http://www.michigan.gov/dnr/0,1607,7-153-30301_33360-144865--,00.html.

Identified HCVA's and ERAs will be managed to conserve, protect, maintain, and/or enhance their defined conservation objectives or values. The management methods used will vary depending on the objective and type of designation. On DNR-managed lands, Ecological Reference Areas may be protected through a variety of mechanisms (refer to Conservation Area Management Guidance). Management activities or prescriptions in Ecological Reference Areas are highly restricted to those that maintain or enhance the defined attributes and values and protect the immediate natural resource values or human health and safety.

This packet is for each High Conservation Value Area (HCVA) without an existing management plan and all Legally Dedicated State Natural Areas, Ecological Reference Areas (ERA), Critical Dunes and Coastal Environmental Areas on state forest land. Its purpose is to: 1.) document baseline information on each area and its conservation values, threats, management goals and objectives, and 2.) to track changes in threats, when management activities are carried out, monitor if they are effective, and capture needed changes in management determined not to be effective.

Keep the original copies of these forms in the Compartment/Stand File within each FMU and send copies to respective DEQ and DNR program managers and the DNR, FMFM Forest Resource Management Section, Monitoring Specialist.

SUMMARY: LOCATION MAP, MANAGEMENT RECOMMENDATIONS

PART I: HCVA BASELINE INFORMATION, GOALS AND OBJECTIVES

COMPLETE FOR EACH HCVA WITHOUT AN EXISTING MANAGEMENT PLAN

PART I TO ACCOMPANY PART II

SECTION 1: SITE INFORMATION

- A. HCVA TYPE
- B. SITE, CONTACT AND ADMINISTRATIVE INFORMATION
- C. OWNERSHIP INFORMATION
- D. CONSERVATION PARTNERS
- E. OTHER DOCUMENTS RELATED TO THIS HCVA

SECTION 2: CONSERVATION VALUES (TARGETS)

- A. BIODIVERSITY VALUES
- B. SOCIAL/ECONOMIC VALUES
- C. INFRASTRUCTURE/FACILITIES VALUES

SECTION 3: CURRENT CONDITIONS (THREATS)

- A. VALUE OR TARGET VIABILITY (POOR, FAIR, GOOD, VERY GOOD)
- B. CURRENT PRIMARY THREATS

SECTION 4: MANAGEMENT GOALS AND OBJECTIVES

PART II: HCVA MONITORING

SECTION 5: COMPLIANCE MONITORING (WERE TASKS COMPLETED?)

SECTION 6: EFFECTIVENESS MONITORING AND RECOMMENDATIONS (HOW WELL DID MANAGEMENT WORK OR WERE OBJECTIVES ACHIEVED? WHAT ARE NEXT THE STEPS?)

SECTION 7: THREATS MONITORING FIELD FORM – STAND ALONE FORM (WHAT IS THE STATUS OF VALUES OR TARGETS?)

MAY BE COMPLETED BY ANYONE FOR ANY HCVA

OR PART OF MONITORING PACKET TO ACCOMPANY PART I AND PARTS II, SECTIONS 6, 7 AND PART III.

Helpful References:

Marqoluis, R. and N. Salafsky. 1998. Measures of Success. Island Press, Washington, DC.362 pp.

The Nature Conservancy. 2005. CAP (Conservation Action Planning) Toolkit - version 08-23-05.

See 2007 overview at <http://sites-conserveonline.org/dcs/projects/art10152.html> and the workbook at http://www.conserveonline.org/2003/07/s/ConPriMgmt_v4

SUMMARY

Shupac Lake Dry Sand Prairie Ecological Reference Area Grayling Forest Management Unit Compartment 271, T28N, R01W, Sec. 7, 8, 17 @ 93 Acres



Compartment 271
 2010 YOE
 T28N R1W
 Sections 7, 8 & 17
 Candidate ERA's

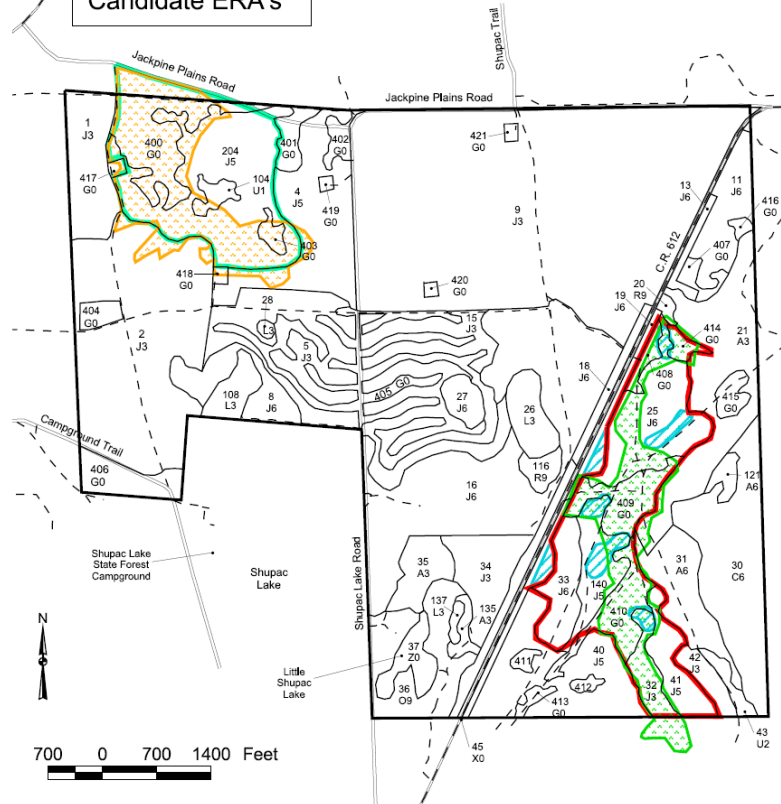
	Dry sand prairie ERA
	Dry sand prairie restoration area
	Pine barrens ERA
	Pine barrens restoration area
	Pine barrens leave islands
	Stand boundaries

Shupac Lake Dry Sand Prairie ERA is in the NW corner of the map.

Nearby in the SE corner of the map is the Shupac Lake Pine Barrens ERA.

All of Compartment 271 is in Lovells Kirtland's Warbler Management Unit, Blocks 49, 50 & 51

Shupac Lake Dry Sand Prairie
 Photo by Bradford Slaughter



RECOMMENDED MANAGEMENT GOALS AND ACTIVITIES (DUPLICATED FROM SECTION 4 AT END OF FORM)

CHECK ALL GOAL CATEGORIES THAT APPLY

- NATURAL COMMUNITY MAINTENANCE OR ENHANCEMENT GOALS
- ECOLOGICAL SYSTEMS MAINTENANCE OR ENHANCEMENT GOALS
- SPECIES MAINTENANCE OR ENHANCEMENT GOALS
- SPECIES RESTORATION GOALS
- SOCIAL ECONOMIC GOALS
- INFRASTRUCTURE/FACILITIES GOALS
- ADMINISTRATIVE GOALS— PROTECTION STATUS; CAPACITY BUILDING; FUNDING, VOLUNTEERS

GOAL# AND DESCRIPTION FROM SECTIONS 2 AND 3

Goal 1: Maintain and enhance (restore) dry sand prairie natural community using prescribed fire.

Objective 1: Develop a prescribed burn plan to maintain and restore dry sand prairie and include adjacent stands to the east where feasible.

Task 1: Design restoration harvest activities to protect the known rare plant populations (ie. through winter harvest restrictions).

Task 2: Treat adjacent jack pine stands (i.e. stand 204 and grassy openings) and pines within the ERA to be compatible with dry sand prairie community restoration and KW plan objectives. Ie. final harvest followed by prescribed burn, and not replant.

Objective 2: Reduce fragmentation and increase size of dry sand prairie community

Task 1: Increase size of ERA by restoring adjacent stand to the East – see Task 2 above.

Task 2: Do not develop new roads and trails within the ERA.

Task 3: Monitor for illegal ATV use.

Objective 3: Control and monitor invasive species and work with conservation groups to implement.

Task 1: Develop a invasive species control and monitoring plan with conservation groups.

Task 2: Be sure the DNR R/W permits to Utility Company for easement management protects the rare plants and dry sand prairie community and explore possibility of co-management .

Task 3: Work with oil/gas leasees to control invasive plants.

Task 4: Notify County Road Commission regarding vulnerability of the area to invasive species from maintenance activities...ie contamination from fill material.

Objective 4: Classify as nonleasable or with restrictions to not allow future surface development.

Goal 2: Work with Conservation Groups and Utility Company to develop public education opportunities about uniqueness and ecology of dry sand prairie and pine barrens communities and associated rare species to tie into restoration goals above.

PART I: HCVA BASELINE INFORMATION , GOALS AND OBJECTIVES

SECTION 1: SITE INFORMATION

A: HCVA TYPE – CHECK ALL THAT APPLY

- | | |
|--|---|
| <input type="checkbox"/> Critical Dune as defined by DEQ | <input type="checkbox"/> Environmental Area as defined by DEQ |
| <input type="checkbox"/> Legally Dedicated State Natural Area | <input type="checkbox"/> State Natural or Scenic River |
| <input checked="" type="checkbox"/> Ecological Reference Area: Shupac Lake Dry Sand Prairie | <input type="checkbox"/> Quiet Area: |
| <input checked="" type="checkbox"/> Endangered Species Management Area | <input type="checkbox"/> Other: |
| <input checked="" type="checkbox"/> Kirtland Warbler Lovell's Block 49, 50, 51 | |
| <input type="checkbox"/> Piping Plover | |
| <input type="checkbox"/> Other: | |

SPECIAL CONSERVATION AREA - LIST OTHER CATEGORIES BELOW

For Regional Ecoplans - Kirtland Warbler Management Area

B: SITE, CONTACT AND ADMINISTRATIVE INFORMATION

Site Name : Shupac Lake Dry Sand Prairie		Other Names: Lovell's KW Management Unit – Block 49	
Report Date Draft September 22, 2008	Forest Mgt Unit Grayling Forest Management Unit	Compartment Number(s): 271 YOE 2010 270 YOE 2006 Stand Number(s) 271: 2, 4, 104, 204, 400, 403 270: 41, 413	<input checked="" type="checkbox"/> Map Attached <input type="checkbox"/> Shape File in OI/IFMAP GDSE File Location/Name
County(ies) Crawford		Township(s) Range(s) Section(s) ¼ Sec. Optional if mapped T28N, R1W, Section(s); 6, 7	
Name of individual completing this form (first and last) <input checked="" type="checkbox"/> Check if DNR Employee Kim Herman, Monitoring Specialist, Forest, Mineral, Fire Management Division (FMFMD) Joan Charlebois, Forester, FMFMD Elaine Carlson, Wildlife Biologist, Wildlife Division, MIO Steve Sendek, Fisheries Biologist, Fisheries Division		Telephone (906) 786-2351, Escanaba (989) 348-6371 ext 7443 (989) 826-3211 ext 7030 (989) 348-6371 ext 7477	Email Address hermank@michigan.gov charlebj@michigan.gov carsone@michigan.gov sendeks@michigan.gov
Additional contact information Name of individual providing information (first and last), if applicable Susan Thiel, FMU Manager, FMFM John Pilon, Planner, FMFM, Gaylord Keith Kintigh, Wildlife Ecologist, Gaylord		Telephone (989) 348-6371 ext 7440 (989) 732-3541 ext 5042 (989) 732-3541	Email Address thiels@michigan.gov pilonj@michigan.gov kintighk@michigan.gov
Name of DNR/DEQ Program Contact if Applicable		Telephone	Email Address
<input type="checkbox"/> Volunteer (s) Number of Volunteers: Name of Group: Contact Name:		Telephone ()	Email Address

C: OWNERSHIP INFORMATION - CHECK ALL THAT APPLY AND INCLUDE NAME OF THE UNIT:

- | | |
|---|--|
| <input checked="" type="checkbox"/> State Forest Land: Grayling Forest Management Unit | <input type="checkbox"/> State Game Area: |
| <input type="checkbox"/> State Park/Recreation Area: | <input type="checkbox"/> Other or Private Land (describe): |

D: CONSERVATION PARTNERS – FILL IN ALL KNOWN PARTNERS

Name of Organization: The Nature Conservancy Contact Name: Christine (Tina) Hall Email Address: chall@tnc.org Telephone (906) 225-0399	Name of Organization Michigan Natural Areas Council Contact Name: Phyllis Higman Email Address: mnac@cyberspace.org Telephone (517)373-6983 (work)
Name of Organization: Contact Name: Email Address Telephone ()	Name of Organization: Contact Name: Email Address Telephone ()

E: OTHER DOCUMENTS RELATED TO THIS HCVA – CITATION AND LOCATION WHERE STORED

Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota, and Wisconsin: a working map and classification. Gen. Tech. Rep. NC-178. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 250 pp

Cohen, J. G. 2008. Draft Site Summary for Shupac Lake Dry Sand Prairie, Natural Community Surveys of Potential Ecological Reference Areas, Michigan Natural Features Inventory, Michigan State University Extension, Lansing, MI Page 51 of 266.

Kirtland Warbler Management Strategy

Kost, M.A. 2004. Natural community abstract for dry sand prairie. Michigan Natural Features Inventory, Lansing, MI. 9 pp. http://web4.msue.msu.edu/mnfi/abstracts/ecology/Dry_sand_prairie.pdf

Kost, M.A., D.A. Albert, J.G. Cohen, B.S. Slaughter, R.K. Schillo, C.R. Weber, and K.A. Chapman. 2007. Natural Communities of Michigan: Classification and Description. Michigan Natural Features Inventory, Report No. 2007-21, Lansing, MI. [Dry Sand Prairie](#)

SECTION 2: CONSERVATION VALUES/TARGETS - CHECK ALL THAT APPLY

A: BIODIVERSITY VALUES

There are a number of ways to describe biodiversity values - check all that apply.

1. **Natural Communities** – Based on Michigan Natural Features Inventory Community Classification.

GO to: http://web4.msue.msu.edu/mnfi/data/MNFI_Natural_Communities.pdf; <http://web4.msue.msu.edu/mnfi/pub/abstracts.cfm>

Quality Rank comes from specific MNFI Element Occurrence Records (EOR) in the FMFM IFMAP Biodiversity Data Layer.

Chk Box	Community Name	State Rank	Global Rank	Quality Rank A,B,C,D
<input checked="" type="checkbox"/>	Dry Sand Prairie	S2	G3	AB

2. **Other information if known.**

Ecological Systems . Check Applicable Regional Landscape Ecosystem (Section), Subsection, and Sub-subsection from Albert, Dennis A. 1995. Regional landscape ecosystems of Michigan, Minnesota, and Wisconsin: a working map and classification. Gen. Tech. Rep. NC-178. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 250 pp

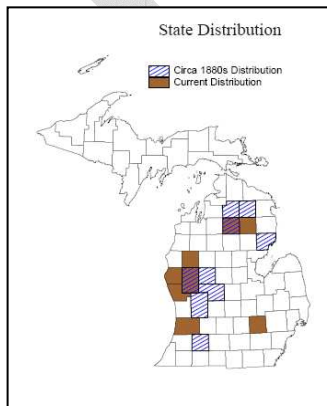
Check all that apply	Name
<input checked="" type="checkbox"/>	Section VII. Northern Lacustrine-Influenced Lower Michigan
<input checked="" type="checkbox"/>	Subsection VII.2. Highplains
<input checked="" type="checkbox"/>	Sub-subsection VII.2.2. Grayling Outwash Plains

3. **Ecological Systems**

List name(s) of Ecosystems/Natural Communities (based on MNFI Community Classification):

Dry Sand Prairie

Overview excerpted from Kost et al 2004. Dry sand prairie is a native grassland community dominated by little bluestem (*Andropogon scoparius*), big bluestem (*Andropogon gerardii*) and Pennsylvania sedge (*Carex pensylvanica*) that occurs on loamy sands primarily on well drained to excessively well drained, sandy glacial outwash plains and lakebeds. Vegetation is typically short and patchy. Historically, dry sand prairie occurred in association with oak barrens, oak-pine barrens, and pine barrens. Areas dominated by native grasses with less than one mature tree per acre (0.4 ha) are considered prairie (Curtis 1959). Photo by Bradford Slaughter.



Summary Draft Site Description from Cohen, 2008.

Shupac Lake

Natural Community Type: Dry Sand Prairie

Rank: G3 S2, globally very rare and local and imperiled in the state

Element Occurrence Rank: AB

Location: Grayling Forest Management Unit, Compartments 270 and 271

Element Occurrence Identification Number: 5909

Site Description: This dry sand prairie is a mosaic of prairie and pine barrens that occurs on a flat outwash plain with dark brown loamy sand (pH 4.5-5.0) over reddish brown coarse-textured sand mixed with cobbles and pebbles (pH 5.0-5.5). The site is surrounded by jack pine (*Pinus banksiana*) forests, plantations, and Kirtland's warbler (*Dendroica kirtlandii*, state endangered) management areas. This dry sand prairie is characterized by a scattered canopy of open-grown jack pine ranging in age up to 40 years and often forming small clumps. The tall shrub layer includes scattered juneberry (*Amelanchier arborea*) and black cherry (*Prunus serotina*). The ground layer is characterized by low species diversity and is dominated by poverty grass (*Danthonia spicata*), little bluestem (*Andropogon scoparius*), big bluestem (*Andropogon gerardii*), Pennsylvania sedge (*Carex pensylvanica*), bearberry (*Arctostaphylos uva-ursi*), and sand cherry (*Prunus pumila*). Rough fescue (*Festuca scabrella*, state threatened), Hill's thistle (*Cirsium hillii*, state special concern), and pale agoseris (*Agoseris glauca*, state threatened) are uncommon throughout the site.

Per review of 1938 and 1952 aerial photos the ERA was within a sheep ranch and was pastured (Joan Charlebois, personal communication).

- Ecological processes** – such as connectivity, hydrology, fire, wind events, flooding, pest and disease cycles;
Describe: Excerpted from Kost et al. 2007. Historically, dry sand prairies were maintained in an open condition as a result of frequent fires, droughty soils, and in northern Lower Michigan, by frequent growing-season frosts. Fire frequency depended on a variety of factors such as type and volume of fuel, topography, and natural firebreaks. Prior to European settlement, intentional ignition by Native Americans and occasional lightning strikes were the main sources of fire. In addition to creating and maintaining the open conditions of dry sand prairies, frequent fires also help preserve species diversity by promoting seed germination and seedling establishment, creating micro-sites for small species, increasing the availability of plant nutrients, and bolstering flowering and seed set.

The excessively drained, sandy soils of dry sand prairie act to perpetuate open conditions by limiting tree establishment, especially during periodic droughts. Growing-season frosts, which also limit tree establishment, especially by hardwoods, are particularly common in the High Plains Subsection of northern Lower Michigan. In this region, dry sand prairie frequently occurs along with pine barrens in lower elevation, flat outwash plains known as frost pockets.

- Underlying environmental features** – such as soils, geology, topography, headwaters;
Describe: Soils of dry sand prairies are typically very strongly acid to medium acid loamy sand with low water-retaining capacity

- Environmental gradients** – such as elevation, precipitation, temperature;
Describe:

- Species and/or community structure** – using during migration, during different life stages, or gradual species turnover across environmental gradients.
Describe:

- Nested large and small natural communities linked by functional or restorable ecosystems:**
Describe:

- High quality natural communities nearby:**
Describe: North Branch of the Au Sable State Natural River @ ½ mile to the west.
Shupac Lake Pine Barrens ERA @ one mile to the east

- Large Block Size:**
General Shape and Acres:

4. **Species Assemblages** – List types of species assemblage targets.

- Major groupings of species** - share common natural processes or have similar conservation requirements (e.g., freshwater mussels, forest-interior birds, essential pollinators).
- Globally significant species aggregations (e.g. migratory shorebird aggregation).**

5. **Species** - List types of species by common and scientific name.:

- Focal species** - keystone, wide-ranging (regional), providing linkages between ecosystems, and umbrella species.

Species: *From Kost et al, 2007.* Ants, particularly the genus *Formica*, play an important role in mixing and aerating prairie soils as they continually build and abandon mounds, overturning large portions of prairie soil in the process. Other important species contributing to soil mixing and aeration include moles, mice, skunks, and badgers. Kirtland's warbler breeds almost exclusively in the matrix landscape of dry sand prairie, pine barrens, and dry-northern forest of northern Lower Michigan.

- Globally imperiled or state endangered or threatened native species** - Ranked G1, G2, G3 by NatureServe, and S1, S2 by MNFI, state and/or federally listed or proposed for listing as Threatened or Endangered (MI and U.S.), and on the IUCN Red List (International).

Species:

[Dendroica kirtlandii \(Kirtland's Warbler\) - MNFI Rare Species Explorer](#)

EO ID 11180

- State Status: E - Endangered (legally protected)
- US Status: LE - Listed Endangered
- State Rank: S1 - Critically imperiled
- Global Rank: G1 - Critically imperiled

[Agoseris glauca \(Prairie or Pale Agoseris\) - MNFI Rare Species Explorer](#)

EO ID 8821 Last Observed 2004

- State Status: T - Threatened (legally protected)
- State Rank: S2 - Imperiled
- Global Rank: G5 - Secure

[Festuca scabrella \(Rough Fescue\) - MNFI Rare Species Explorer](#)

EO ID 343 Last Observed 2004

- State Status: T - Threatened (legally protected)
- State Rank: S2S3 - Rank is uncertain, ranging from imperiled to vulnerable
- Global Rank: G5 - Secure

- Species of Special Concern** - Due to vulnerability, declining trends, disjunct distributions, or endemic status; Ranked S3 by MNFI

Species: [Cirsium hillii \(Hill's Thistle\) - MNFI Rare Species Explorer](#)

EO ID 11792 Last Observed 2004

- State Status: SC - Special Concern (rare or uncertain; not legally protected)
- State Rank: S3 - Vulnerable
- Global Rank: G3 - Vulnerable

- Other species of greatest conservation need** - Identified as part of Michigan's Wildlife Action Plan due to declining populations or other characteristics that may make them vulnerable.

Species:

B: KNOWN SOCIAL/ECONOMIC VALUES

- Archaeological
- Historical:
- Recreational:
 - Camping :
 - Canoeing/Kayaking:
 - Fishing:
 - Hiking/Backpacking:
 - Hunting/Trapping: **Deer Hunting**
 - Photography
 - Scenic
 - Water (lake, river, stream):
 - Wildlife Viewing: **Kirtland Warbler**
 - Cross Country Skiing
 - Other :
- Restorative/Spiritual
- Traditional Use/Gathering : **Blueberry picking?**

C: EXISTING INFRASTRUCTURE/FACILITIES:

- American Disability Accessibility (ADA) Considerations
- Boat Launch(es)
- Bridge(s):
- Campground(s):
- Interpretive Displays:
- Marked boundaries
- Parking lot(s):
- Posted use rules
- Scenic Overviews
- Toilet(s)
- Trails/Boardwalks:
- Other: **Oil/gas well pad and pipeline along west edge buried along edge of two track, 2cd well pad on the south side of the ERA**

SECTION 3: CURRENT CONDITIONS

D. CURRENT STATUS/VIABILITY OF CONSERVATION VALUE/TARGET (FROM TNC CAP TOOL KIT)

STATUS DEFINITIONS – POOR - IMMINENT LOSS, FAIR – VULNERABLE, GOOD – MINIMUM INTEGRITY, VERY GOOD - OPTIMAL INTEGRITY

LIST CONSERVATION VALUE/TARGET FROM SECTION 2 – A, B OR C	LIST CATEGORY OF SIZE, CONDITION, OR LANDSCAPE CONTEXT	LIST KEY ATTRIBUTE	LIST INDICATOR	LIST CURRENT STATUS POOR, FAIR, GOOD, OR VERY GOOD
DRY SAND PRAIRIE	LANDSCAPE CONTEXT CONDITION	COMMUNITY STRUCTURE	FLORISTIC QUALITY	VERY GOOD - GOOD
RARE PLANTS	LANDSCAPE CONTEXT CONDITION	POPULATION	PRESENCE	?
KIRTLAND WARBLER	LANDSCAPE CONTEXT	PRAIRIE IS PART OF LARGER LANDSCAPE	N/A	WARBLERS ARE NOT USING THE PRAIRE FOR NESTING

E. : INITIAL PRIMARY THREATS ASSESSMENT TO ESTABLISH BASELINE CONDITION

CHECK ALL THAT THERE IS ACTUAL EVIDENCE FOR AND DESCRIBE THE EVIDENCE BRIEFLY AND/OR ATTACH PHOTOS

DO THIS INITIALLY FROM AERIAL PHOTOS, LOCAL KNOWLEDGE, AND EXISTING DATA FOLLOWED BY A SITE VISIT.

- A. Habitat Conversion & Degradation** – Complete or substantial **loss of or damage** to natural habitats.
- Altered Fire Regime -*suppression or increase in fire frequency and/or intensity outside of its natural range of variation:*
Fire suppression policy in place, area has not been prescribed for fire.
 - Altered Hydrologic Regime Changing water flow patterns outside their natural range of variation (*surface water diversion, groundwater pumping, dam operations*)
 - Commercial & Industrial Development: *factories, stand-alone shopping centers, office parks, train yards, docks, ship yards, airports, landfills*)
 - Farms & Plantations Agricultural operations - *commercial farms, industrial plantations, feed lots, aquaculture*
 - Housing & Urban Development Expansion of cities, towns, settlements, non-housing development - *urban areas, suburbs, villages, homes, shopping areas, offices, schools, hospitals*
 - Military Activities Actions by formal or paramilitary forces (*military bases, defoliation, munitions testing* :
 - Natural System Modifications Actions that convert or degrade habitat to “managing” natural systems for human welfare - *dam construction, land reclamation, wetland filling, rip-rap along shoreline, levees and dikes*
 - Recreation Areas Recreation sites with a substantial footprint *ski areas, golf courses, resorts, county parks*
 - Other:

E. : INITIAL PRIMARY THREATS ASSESSMENT TO ESTABLISH BASELINE CONDITION
CHECK ALL THAT THERE IS ACTUAL EVIDENCE FOR AND DESCRIBE THE EVIDENCE BRIEFLY AND/OR ATTACH PHOTOS
DO THIS INITIALLY FROM AERIAL PHOTOS, LOCAL KNOWLEDGE, AND EXISTING DATA FOLLOWED BY A SITE VISIT.

- B. Transportation Infrastructure** – Long narrow corridors **altering, fragmenting, and disturbing** natural habitat and species, including soil erosion/sedimentation, and providing routes for invasive or problematic species.
- Flight Paths :
 - Railroads:
 - Roads and Trails: **Jack Pine Plains Road – County Rd. borders north side of ERA**
 - Shipping Lanes:
 - Trails:
 - Utility Lines. **Overhead power line with associated right-of-way maintenance, not used by public, just by maintenance workers.**
 - Stream Crossings - *culverts, bridges* :
 - Other:
-
- C. Energy & Mining** – Production of non-biological resources **having negative impacts** to conservation values.
- Mining – *Exploring, developing, and producing.* **DNR owns all minerals**
 - Oil & Gas Drilling **Oil/gas well pad and pipeline along west edge buried along edge of two track, 2cd well pad on the south side of the ERA**
 - Renewable Energy – *Exploring, developing, and producing.*
-
- D. Biological Resource Harvesting** –Over or under consumption of “wild” resources **resulting in loss** of conservation values.
- Gathering – *Harvesting plants, fungi, and other non-timber/non-animal products for commercial, recreation, or subsistence purposes.*
 - Grazing
 - Hunting, Trapping & Fishing
 - Timber Harvesting:
-
- E. Recreation & Research** – Non-consumptive uses of biological resources **resulting in damage** to natural resources.
- Human-Powered Recreation – *mountain bikes, hikers, backpackers, cross-country skiers, rock climbers, canoeists, kayakers, hang-gliders, birdwatchers, photographers*
 - Motor-Powered Recreation - *Traveling outside of established transport corridors: off-road vehicles, motorcycles, motorboats, jet-skis, snowmobiles, ultra-light planes.*
If county decides to open roads to ATV use, could increase access and illegal usage.
 - Scientific Research – *Ecosystem manipulations* **Dry sand prairie and pine barrens plant communities are natural associates, so the ERA management plan can be designed to compliment KW habitat management.**
-
- F. Pollution** – Introduction of exotic and/or excess materials from point and non-point sources with **evidence of resource damage.**
- Chemicals & Toxins
 - Greenhouse Gasses –*CO₂, methane*
 - Light Pollution
 - Noise Pollution
 - Nutrient Loads
 - Radioactive Materials
 - Salt/Brine: **Unknown**
 - Solid Waste – *garbage, litter*
 - Thermal Pollution
 - Waste & Residual Materials – *dredge spoil, water treatment residuals, slash, mine tailings, excess sediment loads.*
-
- G. Invasive & Other Problematic Species & Genes** – Aquatic or terrestrial non-native and native species or genetic materials that have or are predicted to have harmful effects on biodiversity following their introduction, spread and/or increase in abundance.
- List species, extent of infestation and fill out Forest Health Form.
- Introduced Genetic Material
 - Invasive Species: **Knappweed and St. John’s wort**
 - Problematic Native Species:
 - Hybrid Species
-
- H. Climate Change** – Evidence of impacts from long-term changes linked to global warming and other climate issues.
- Climate Variability – Intensification and/or alteration of normal weather patterns - *droughts, high wind or rain event.*
 - Habitat Shifting & Alteration
-
- I. Other**

SECTION 4: RECOMMENDED MANAGEMENT GOALS AND ACTIVITIES (DUPLICATED IN SUMMARY UP FRONT)
LIST GOAL(S), FOR EACH VALUE, RELATED THREAT ABATEMENT, MAINTENANCE OR ENHANCEMENT NEED IDENTIFIED IN SECTIONS 2 AND 3

CHECK ALL GOAL CATEGORIES THAT APPLY

- NATURAL COMMUNITY MAINTENANCE OR ENHANCEMENT GOALS**
- ECOLOGICAL SYSTEMS MAINTENANCE OR ENHANCEMENT GOALS**
- SPECIES MAINTENANCE OR ENHANCEMENT GOALS**
- SPECIES RESTORATION GOALS**
- SOCIAL ECONOMIC GOALS**
- INFRASTRUCTURE/FACILITIES GOALS**
- ADMINISTRATIVE GOALS– PROTECTION STATUS; CAPACITY BUILDING; FUNDING, VOLUNTEERS**

GOAL# AND DESCRIPTION FROM SECTIONS 2 AND 3

Goal 1: Maintain and enhance (restore) dry sand prairie natural community using prescribed fire.

Objective 1: Develop a prescribed burn plan to maintain and restore dry sand prairie and include adjacent stands to the east where feasible.

Task 1: Design restoration harvest activities to protect the known rare plant populations (ie. through winter harvest restrictions).

Task 2: Treat adjacent jack pine stands (i.e. stand 204 and grassy openings) and pines within the ERA to be compatible with dry sand prairie community restoration and KW plan objectives. ie. final harvest followed by prescribed burn, and not replant.

Objective 2: Reduce fragmentation and increase size of dry sand prairie community

Task 1: Increase size of ERA by restoring adjacent stand to the East – see Task 2 above.

Task 2: Do not develop new roads and trails within the ERA.

Task 3: Monitor for illegal ATV use.

Objective 3: Control and monitor invasive species and work with conservation groups to implement.

Task 1: Develop a invasive species control and monitoring plan with conservation groups.

Task 2: Be sure the DNR R/W permits to Utility Company for easement management protects the rare plants and dry sand prairie community and explore possibility of co-management .

Task 3: Work with oil/gas leasees to control invasive plants.

Task 4: Notify County Road Commission regarding vulnerability of the area to invasive species from maintenance activities...ie contamination from fill material.

Objective 4: Classify as nonleasable or with restrictions to not allow future surface development.

Goal 2: Work with Conservation Groups and Utility Company to develop public education opportunities about uniqueness and ecology of dry sand prairie and pine barrens communities and associated rare species to tie into restoration goals above.