7 – Appendices

Appendix A – Michigan Department of Natural Resources Administrative Boundaries

Office of Land and Facilities (OLAF)/Facilities Operations and Support (FOS)

The mission of OLAF/FOS is to promote the Department of Natural Resources' mission by serving the public in a friendly, professional and helpful manner and provide quality support services to division field operations employees.

EUP administrative support is provided by OLAF/FOS. The EUP administrative area is comprised of four offices: the Newberry Operations Service Center (OSC), Naubinway Field Office, Sault Ste. Marie Field Office and the Shingleton Field Office. The administrative area has a manager (a core team member of the EUP Ecoregion), account technician, three full time secretaries, and three part time secretaries. Land and Facilities supports the Department's natural resources management responsibilities by providing quality facility management and real estate services.

The primary function of these employees is to support the user divisions: Forest, Mineral and Fire Management; Fisheries, Wildlife, Land and Facilities, Law Enforcement and Office of Communications, in all aspects of administrative duties such as accounting and secretarial. FOS also services the public by being a first line of communication between the public and the user divisions. The OSC and two of the field offices in this administrative area also support License Control by using the Retail Sales System (RSS), the license program for the State of Michigan. All hunting, fishing and trapping licenses plus state park, snowmobile and Off Road Vehicle (ORV) stickers can be sold through this program.

Office of Land and Facilities / Land Survey Unit

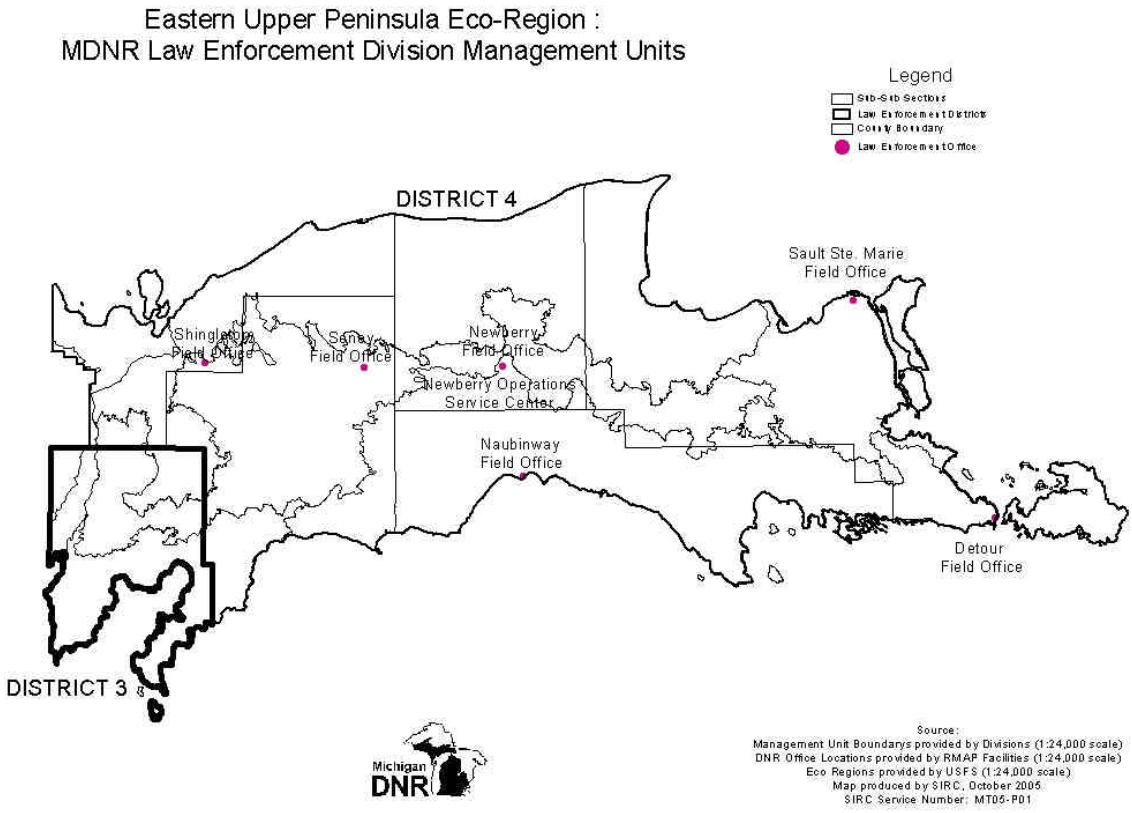
A survey crew under OLAF is stationed out of the Newberry OSC and covers the land surveying needs of the EUP. The survey crew is comprised of one Senior Land Surveying Technician and one Land Survey Technician. Supervision of the EUP crew is by a Registered Land Surveyor stationed out of the Baraga OSC. Requests for land survey projects originate mainly though the land managing divisions of the DNR. The majority of the land survey crews' time (99%) is spent on FMFMD timber sale and state land trespass cases. These projects are for determining boundary lines and setting corners to delineate state land.

Office of Communications

The Office of Communications has an interpretive manager located at the Newberry OSC. The manager oversees permanent and seasonal park interpreters throughout the Upper and Northern Lower Peninsulas. These interpreters are often the only contact state park visitors have with the DNR. They conduct programs which explain significant cultural and natural features within the park. Park interpreters also do outreach programs, create audio-visual programs, and design wayside exhibits, pamphlets and other educational materials for the DNR.

Law Enforcement Division, (LED)

Figure 7.1 EUP Law Enforcement Division Management Units



The mission statement of the Law Enforcement Division is to protect Michigan's natural resources and the environment, and the health and safety of the public through effective law enforcement and education.

In the EUP Ecoregion the Law Enforcement Division (District 4) structure includes Alger, Chippewa, Luce, Mackinac, Marquette and Schoolcraft Counties. LED District 3 includes Delta County.

There are three administrative areas in LED District 4. Area 1 is Marquette County and West Alger County. Area 2 is East Alger County, Luce County, West Chippewa County, West Mackinac County and Schoolcraft County. Area 3 is Central and East Chippewa County and East Mackinac County.

The entire LED District 4 is under the command of one lieutenant (a core team member of the EUP Ecoteam) who is stationed at the Newberry OSC. Each of the Law Enforcement areas has one sergeant assigned as the immediate supervisor and six field officers. The current staffing level is: Area 1, one sergeant and four field officers; Area 2, one sergeant and two to three field officers; Area 3, one sergeant and four to five field officers. District 4 Conservation Officers are patrolling 5,424 square miles and District 3 Officers patrol 668 square miles within the EUP Ecoregion.

Conservation officer duties vary from season to season. Day-to-day work primarily consists of dealing with persons recreating out-of-doors. Conservation officer's work varied shifts, often outside in inclement weather. Examples of work include: observing and checking hunters and anglers; enforcing regulations governing the operation and use of snowmobiles, off road vehicles and watercraft; enforcing laws that protect the environment; and outdoor recreation safety education, such as hunter safety classes, marine safety classes and snowmobile safety classes.

Conservation officers are certified Michigan Peace Officers, and are also empowered to enforce general Michigan criminal Law in the State of Michigan. They write criminal case briefs and assist other law enforcement agencies as requested.

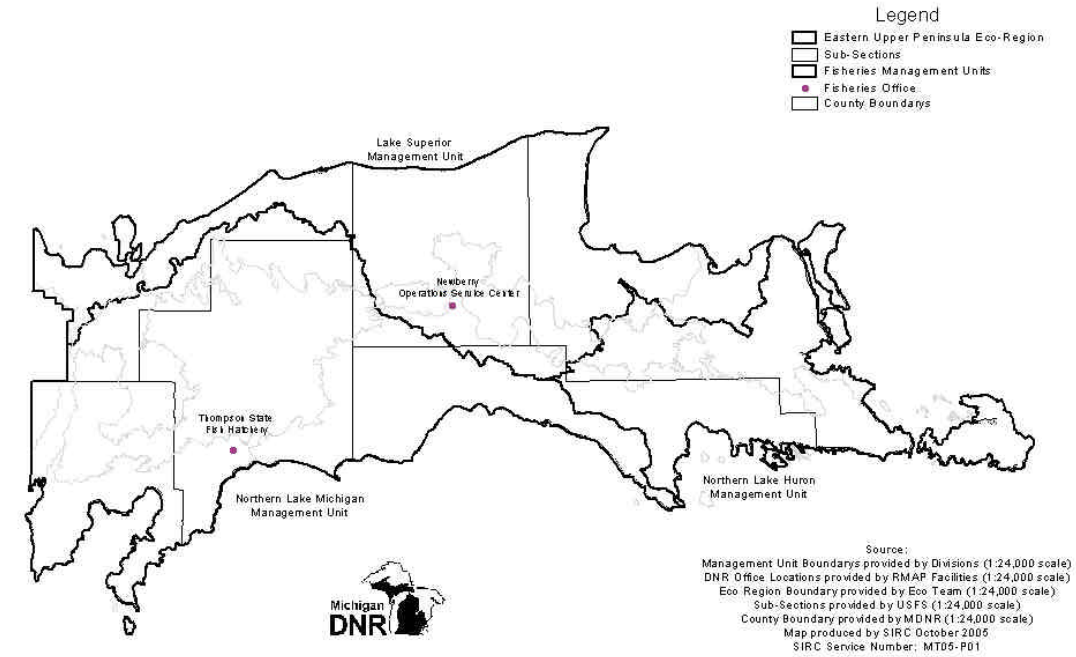
Fisheries Division

The mission of the Fisheries Division is to protect and enhance the public trust in populations and habitat of fishes and other forms of aquatic life, and promote optimum use of these resources for benefit of the people of Michigan.

Aquatic resources encompass fish species, all other aquatic organisms and their habitats. The division implements ecosystem management using ten guiding principles:

1. Recognize limits on productivity.
2. Preserve and restore fish habitats.
3. Preserve native species.
4. Enhance natural reproduction of native and desirable naturalized fishes.
5. Acknowledge the role of stocked fishes.
6. Recognize naturalized species.
7. Adopt the genetic stock concept.
8. Recognize that fisheries are an important cultural heritage.
9. Prevent unintentional introduction of exotic species.
10. Protect and enhance threatened or endangered species

Figure 7.2 EUP Fisheries Division Management Units



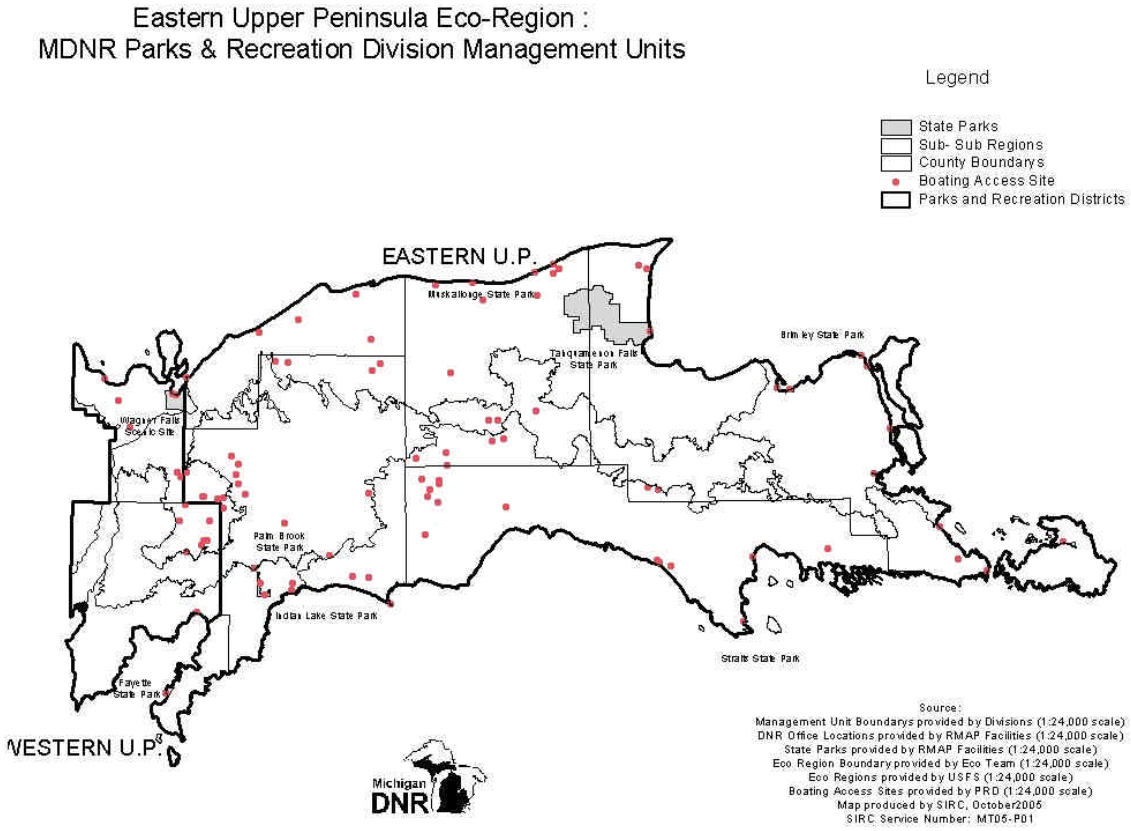
The EUP Ecoregion encompasses three fisheries management units, located in three Great Lakes basins. In the Lake Huron basin (140,389 acre watershed), the Northern Lake Huron Management Unit (MU) is based in Gaylord and the staff is supervised by the Lake Huron basin coordinator (a Lansing position). For the Lake Michigan basin (1,811,892 acre watershed), the Northern Lake Michigan MU, located in Escanaba, is supervised by the Lake Michigan basin coordinator at Plainwell. The Lake Superior basin, (1,964,851 acre watershed) is supervised by the Lake Superior basin coordinator located at the Eastern Lake Superior MU in Newberry. There is also a DNR hatchery near Thompson, which is supervised by the Fisheries Biologist posted there. This hatchery and the Marquette hatchery are supervised by the Marquette Hatchery Manager.

The Newberry OSC office houses the Eastern Lake Superior Unit Manager (a core team member of the EUP Ecoteam), a Fisheries Biologist, and three Fisheries Technicians. They all provide Fisheries management for the Eastern Lake Superior Basin.

Parks and Recreation Division

The mission of Parks and Recreation Division is to acquire, protect, and preserve the natural, historic and cultural features of Michigan's unique resources and provide public recreation and educational opportunities.

Figure 7.3 EUP Parks & Recreation Division Management Units



In the EUP Ecoregion, Parks and Recreation Division administers seven state parks, three state harbors, one scenic site, approximately 61 Boating Access Sites (BAS), as well as numerous islands, isolated land holdings on small rivers and streams and one national memorial. Within the EUP Ecoregion the Parks and Recreation Division and Mackinac State Historic Parks administers 42,885 Acres.

There are two administrative Parks and Recreation units found within the EUP Ecoregion. The Newberry Operations Service Center (OSC) houses a District Supervisor (a core member of the EUP Ecoteam) administers all Parks and Recreation sites except Indian Lake Palms Book, Fayette, and Wagner Falls that are administered out of the Baraga OSC. Staffing at the Newberry OSC also includes a Park and Recreation Manager that oversees access sites and harbors. The seven member Mackinac Island State Park Commission administers Mackinac Island State Park.

State Parks / Field Offices in the EUP Ecoregion

Straits State Park
(2004 Visitation: 73,135) (181 Acres)
Administered by a park supervisor with administrative support, three seasonal park rangers and twelve summer rangers.

Father Marquette (National Memorial) (58 Acres)
Administered by staff from Straits State Park

Brimley State Park
(2004 Visitation: 84,246) (165 Acres)
Administered by a park supervisor with administrative support provided by Straits State Park. The staff is made up of two seasonal park rangers and nine summer rangers.

Tahquamenon Falls State Park
(2004 Visitation: 481,833) (38,496 Acres)
Administered by a park manager with an administrative support person, word processing clerk, park supervisor, three permanent park rangers, five seasonal park rangers, one seasonal janitor, seventeen summer rangers and a park interpreter.

Muskallonge Lake State Park
(2004 Visitation: 74,741) (217 Acres)
Administered by a park supervisor with one seasonal park ranger. Nine summer rangers and administrative support from Tahquamenon Falls State Park.

Palms Book State Park
(2004 Visitation: 51,648) (388 Acres)
Administered by Indian Lake State Park

Wagner Falls Scenic Site (22 Acres)
Administered by Indian Lake State Park

Indian Lake State Park
(2004 Visitation: 66,869) (847 Acres)
Administered by a park supervisor with an administrative support person and four seasonal park rangers. Park staff also operates and maintains 20 BAS and a remote campground on the west side of Indian Lake.

Fayette State Park - (Dedicated National Historic Site)
(2004 Visitation: 70,712) (711 Acres)
Administered by a park supervisor with administrative support at Indian Lake State Park. Staff includes a permanent carpenter, three seasonal park rangers and 11 summer rangers.

Mackinac Island Historic State Park (Dedicated National Historic Site)
(Over 800,000 Visitations) (1,800 Acres) *www.mackinacparks.com*

The mission of Mackinac State Historic Parks we protect, preserve and present Mackinac's rich cultural and natural resources to provide outstanding educational and recreational experiences for the public.

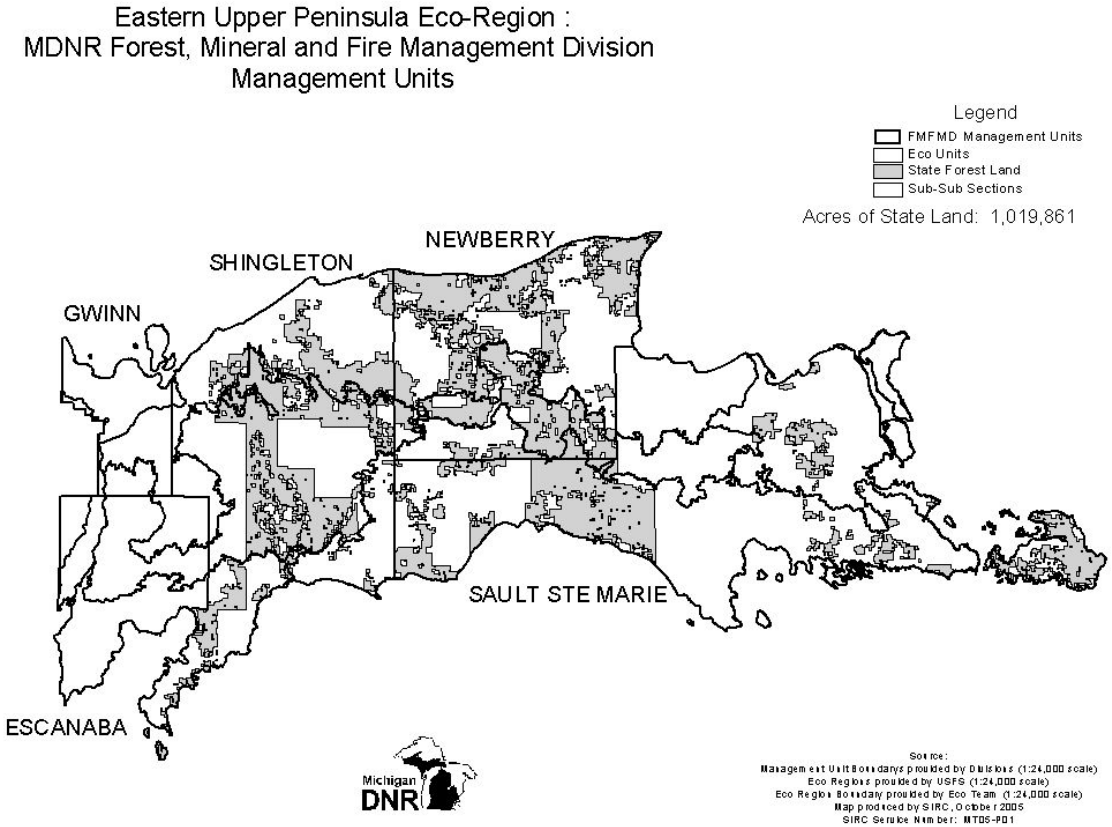
Created in 1895, this was Michigan's first park. The Park is administered by the seven-member Mackinac Island State Park Commission.

Forest, Mineral, and Fire Management Division (FMFMD)

The Mission of Forest, Mineral, and Fire Management Division is to provide for the protection, integrated management and responsible use of a healthy productive forest and mineral resource base for the social, recreational, environmental and economic benefit of the people of the State of Michigan.

The EUP FMFMD has a district supervisor (a core team member of the EUP Ecoteam) assigned to the Newberry Operations Service Center (OSC). Also at the OSC are several staff members with EUP Ecoregion responsibilities: inventory and planning specialist, recreation specialist, service forester, roving forester, timber management specialist and a part-time secretary. The district supervisor reports to the UP field coordinator located in Marquette. Any of the staff assigned to the UP field coordinator may assist on projects or have assignments in the EUP Ecoregion, as part of their functions. The ORV technician, for example, is housed in the Newberry OSC, but has UP wide responsibilities. Similarly, Wyman nursery is located in the EUP Ecoregion but has statewide responsibility for tree seedling production.

Figure 7.4 EUP Forest, Mineral & Fire Management Division Management Units



There are presently three FMFM Forest Management Units in the EUP Ecoregion that manage 1,043,716 acres of forested land: Newberry, Shingleton, and Sault Ste. Marie. There are several satellite stations including, Detour and Naubinway for Sault Ste. Marie, and Seney and Wyman Nursery for Shingleton Forest Management Unit. The unit managers have assistant managers for Land Management and for Fire/Recreation Programs. Foresters and forest technicians handle land use issues, operations

inventory and timber sales on state land. Fire officers handle recreational maintenance, road maintenance and maintain fire equipment. Fire officers are required to fight fire and participate in prescribed fire operations. Many foresters and forest technicians are involved in these activities as well as any other DNR personnel who wish to become fire line qualified. Sometimes fire fighters are required to work out side of the ecoregion, or even out of the state.

Forest Management Units/Field Offices in the EUP Ecoregion

Shingleton Forest Management Unit

The Shingleton Forest is located in Schoolcraft County and East Alger County with field offices in Seney and Wyman Nursery in Manistique. Staff includes a Forest Unit Manager and Forest Fire Officer Supervisor, five foresters, one forest technician and six fire officers.

- 376,435 Acres of State Forest land.
- 11 State Forest Campgrounds with 130 sites.
- 2005 Visitations 4,446
- 4 State Forest Pathways 39.75 miles.
- 29 Miles of ORV Trails.
- 512 Miles of Snowmobile Trails – with 5 Trail sponsors.

Newberry Forest Management Unit

The Newberry Forest Unit is located in Luce County and the north west two Townships of Chippewa County. Staff includes a Forest Unit Manager and Forest Fire Officer Supervisor, four foresters, and three fire officers.

- 346,446 Acres of State Forest land.
- 17 State Forest Campgrounds with 329 sites.
- 2005 Visitations 12,388 camper days.
- 2 State Forest Pathways 15.25 miles.
- 141 Miles of ORV Trails.
- 237 Miles of Snowmobile Trails – with 2 Trail sponsors.

Sault Ste Marie Forest Management Unit

The Sault Ste Marie Forest Unit is located in Chippewa and Mackinac Counties with field offices at Detour Village and Naubinway. Staff includes a Forest Unit Manager and Forest Fire Officer Supervisor, five foresters, two forest technicians, and four fire officers.

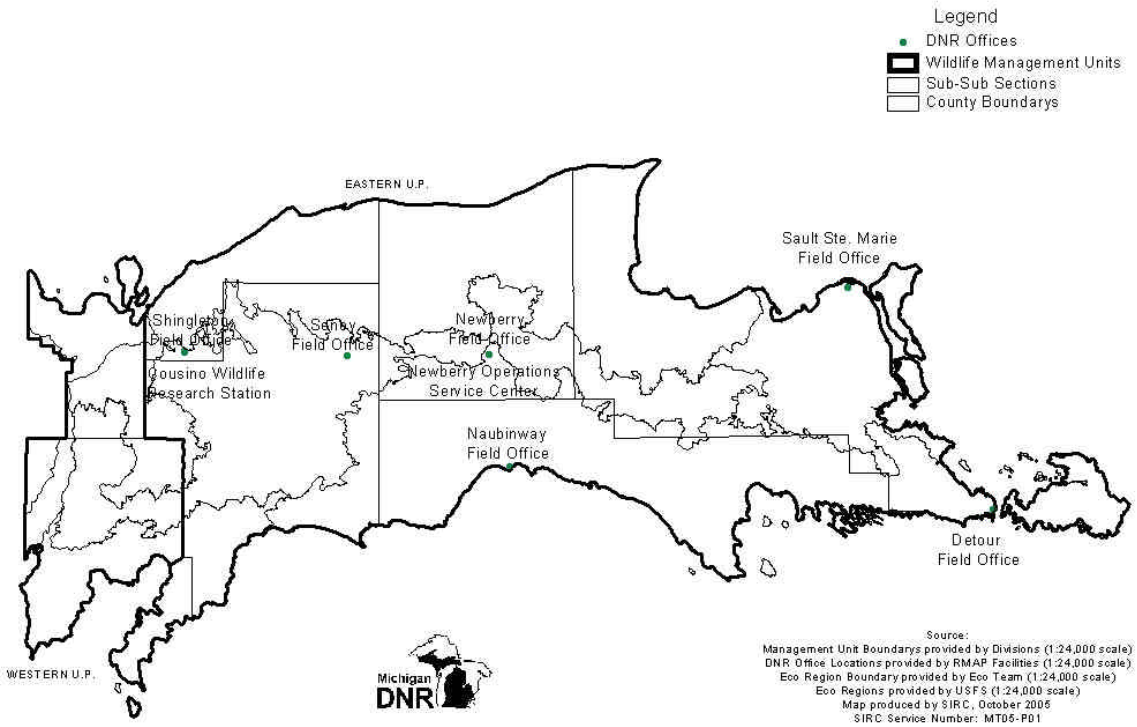
- 320,835 Acres of State Forest land.
- 11 State Forest Campgrounds with 279 sites.
- 2005 Visitations 8,186 camper days.
- 6 State Forest Pathways 23.40 miles
- 250 Miles of ORV Trails.

- 566 Miles of Snowmobile Trails – with 8 Trail Sponsors.

Wildlife Division (WD)

The mission of the Wildlife Division is to enhance, restore and conserve the state's wildlife resources, natural communities and ecosystems for the benefit of Michigan's citizens, visitors and future generations.

Figure 7.5 EUP Wildlife Division Management Units



Wildlife personnel not only have the primary responsibility for the management and regulation of bird and mammal species and their habitats but also have the lead responsibility for rare species which includes plants, insects, amphibians, reptiles and fish. Wildlife Division has joint management responsibilities with FMFMD for state forest management activities.

The EUP Ecoregion boundary contains all of the Wildlife Division's EUP Management Unit which is comprised of Chippewa, Mackinac, Luce, and Schoolcraft Counties, the eastern part of Alger County and the Garden Peninsula in Delta County (5,228 square miles). The EUP District Wildlife Biologist (a core team member of the EUP Ecoteam) and a Wildlife Ecologist are located in the Newberry OSC office. Wildlife field personnel are located at the Sault Ste. Marie, Naubinway, Newberry, and Shingleton Field Offices. The Cusino Wildlife Research Station is located at Shingleton. The remaining western part of the EUP Ecounit in Delta and western Alger counties (864 square

miles) are administered by the Western Upper Peninsula Management Unit which has its headquarters in Marquette.

CHARGES TO ECOUNIT TEAMS

"The Michigan Department of Natural Resources is committed to the conservation, protection, management, use and enjoyment of the State's natural resources for current and future generations"

In mid –1997 the Michigan Department of Natural Resources began developing a comprehensive program to adopt a holistic resource management process. This program has been known as Joint Ventures. The primary objective is to develop strategies for sustainable resource planning and management. The core of this approach is to utilize principles of ecosystem management, application of new technologies such as geographic information systems (GIS), and implementation of adaptive management techniques to sustain the diversity and productivity of Michigan's natural resources.

The appointment of Ecounit Teams to guide resource assessments, planning and management is a significant step in implementing Joint Ventures. The mission of the Ecounit Teams is:

"To plan and coordinate management of Michigan's natural resources, utilizing ecosystem management principles."

To fulfill this mission the Statewide Council presents the following charges to the Ecounit Teams:

- **Principles of ecosystem management will be utilized for planning and managing Michigan's natural resources.** The Ecological Society of America described 8 elements of ecosystem management that have been endorsed by the Statewide Council:

  1. *Sustainability.* Ecosystem Management does not focus primarily on "deliverables" but rather regards intergenerational sustainability as a precondition.
  2. *Goals.* Ecosystem Management establishes measurable goals that specify future processes and outcomes necessary for sustainability.
  3. *Sound ecological models and understanding.* Ecosystem Management relies on research performed at all levels of ecological organization.
  4. *Complexity and connectedness.* Ecosystem Management recognizes that biological diversity and structural complexity strengthen ecosystems against disturbance and supply the genetic resources necessary to adapt to long-term change.
  5. *The dynamic character of ecosystems.* Recognizing that change and evolution are inherent in ecosystem sustainability, Ecosystem management avoids attempts to "freeze" ecosystems in a particular state or configuration.
  6. *Context and Scale.* Ecosystem processes operate over a wide-range of spatial and temporal scales, and their behavior at any given location is greatly affected by surrounding systems. Thus there is no single appropriate scale or timeframe for management.
  7. *Humans as ecosystem components.* Ecosystem Management values the active role of humans in achieving sustainable management goals.

8. *Adaptability and accountability*. Ecosystem Management acknowledges that current knowledge and paradigms of ecosystem function are provisional, incomplete, and subject to change. Management approaches must be viewed as hypotheses to be tested by research and monitoring programs.

- **Ecounit Team members are responsible for communicating and implementing the cultural shift necessary for successful implementation of the Joint Ventures philosophy.** Historically the DNR has managed the State's natural resources on a "Divisional" basis. Each Resource Division focused on the resources for which it was directly responsible. Input or impact analyses on resources managed by other Divisions occurred infrequently. New technologies, and a growing recognition by the DNR and the public that decisions impact on resources beyond those explicitly managed, have created an opportunity to apply a broader management strategy for the State's natural resources. This change in the basic culture of an agency cannot come about without the acceptance by personnel who will carry out this plan. More specifically, Ecounit Teams will:

  1. Focus on Divisional, inter-Divisional and stakeholder communications as a way of implementing coordinated management.
  2. Identify communication/education needs (internal and external) as part of the planning process.
  3. Identify barriers to communications that the Statewide council can help remove
  4. Identify public communication needs that can be integrated with other public communication strategies or work plans.

- **Ecounit Teams will define appropriate geographic boundaries for their Ecounits.**

  1. It has been suggested that the boundary for the Eastern Upper Peninsula Ecounit be a line roughly corresponding with the western boundary of the Hiawatha National Forest. For purposes of resource assessment, planning and management, a final boundary decision needs to be made.
  2. A decision also needs to be made on a boundary (or boundaries) for the Northern Lower Peninsula (NLP) Ecounit. It has been suggested that the entire NLP might be too large and diverse an area for one planning effort. The NLP Ecounit Team will determine the appropriate geographic scale for the Ecounit(s) and provide the decision and rationale to the Statewide Council. If the NLP is to be subdivided the team should consider appropriate boundaries such as watersheds, terrestrial ecological classifications, political boundaries or other features.

- **The Ecounit Team will be responsible for resource assessments for the Ecounit.** Resource assessments will be conducted at appropriate scales and at the Ecounit level will include assessments across all ownerships. Terrestrial resource assessment and planning will utilize the hierarchical classification developed by Albert (1994). The DNR can only conduct management on state land and aquatic resources, however ecounit managers must recognize that private land management can influence state land management activities. Examples include assessments of timber resources on public and private lands, habitat for threatened and endangered species, private and public natural or reserved areas, habitat corridors, mineral resources, and other values. The Integrated Forest Management Application Program (IFMAP) provides a model for resource assessment at a variety of spatial scales.

- **Ecounit Teams will be responsible for developing resource management plans for the Ecounit.**

  1. Ecounit Teams will use the prototype planning process developed for the Lake Superior State Forest in cooperation with BioForest Technologies, Inc. as a model planning process. This process will be evaluated and modified as necessary by each Ecounit Team. The Statewide Council must review modifications.

  2. Plans for aquatic and terrestrial values may differ in geographic scale and format but must be compatible with goals and objectives developed in the planning process. Terrestrial management influences aquatic resources. Aquatic resource management impacts recreation and other values.

3. Resource management plans may be thought of as hierarchical or layers comprising a whole. There are many scales of resource planning that must be considered when developing resource management plans. Other plans to consider may range from Regional plans such as the Lake Area Management Plans to globally significant species recovery plans to site specific management requirements for wolf denning sites, and raptor nests.

4. Each Division's annual operational plans (e.g. annual timber harvest, habitat management, species management, mineral management etc.) will be compatible with the Ecounit's resource management plan.

- **The Ecounit Teams will determine a reasonable time frame for development of resource management plans.** Planning will not be delayed because of "incomplete" resource assessments. There is never "enough" information. However, because of the dynamic nature of the planning process adaptations can be made as necessary
- **Ecounit Teams will operate as self-directed work teams.**

  1. If an Ecounit Team member has concerns about a Division-specific issue or policy clarification should be obtained from an appropriate Division staff member e.g. Field Coordinator or Program Specialist.

  2. If a team has concerns about policies or issues that span Divisions or Ecounits they should go to the Statewide Council for clarification or guidance.

- **Existing laws, policies and Division's goals and objectives will determine Ecounit Teams' management authority. However Ecounit Teams are encouraged to recommend improvements.**
- **Each Ecounit Team will select a team leader and representative to the Statewide Council.** Each team will determine the appropriate time frame for serving in these positions. The same or different individuals can hold these positions.
- **Ecounit Teams need to have linkages to Division staffs and Management Teams.** Divisions may need to assign a staff member (such as Field Coordinator or Staff Planner) to serve as a liaison between staff and the Ecounit Team. Divisions not having direct involvement in the process (HRD, Audit, Legal Services, I&E) may appoint a contact person to maintain communications with the Ecounit Teams.
- **Ecounit Teams are responsible for distributing information to keep the DNR and the public informed about their activities.** Teams will develop a communications strategy for sharing information and updating Department personnel and stakeholders on team activities. Teams should work closely with the Information and Education Division on communications strategies.
- **Ecounit Teams are responsible for identifying training needs. The Department Training Officer and Division Training Officers shall be kept apprised of training needs.** Funding training will generally be worked into Division budgets.
- **Ecounit Teams will utilize existing staff to the greatest extent possible for resource assessment and planning.** Wildlife and Forest Management Divisions will both have permanent staff assigned to support the Ecounit Team. The Ecounit Team will be responsible for work assignments and can assign tasks to any employees in the Ecounit through the respective Division's team member. For instance, there may be instances where information is needed on fire management, forest health, or threatened and endangered species that can be imported from existing field staff. There may be other instances where specialized skills and information need to be imported from outside agencies. Each team member will work with Division staff to resolve employee time and workload issues required for resource assessment and planning.
- **Ecounit Teams will utilize the current process for requesting services from the Spatial Information Resource Center.** If issues arise that cannot be resolved by the ViGIL board the Statewide Council will resolve them.
- **The Ecounit Teams will work with FOSB to ensure that clerical support is available for the Ecounit Team.** This could be a significant time consumer for clerical support staff. Meeting minutes

need to be recorded and distributed, mailing lists maintained, meetings arranged etc. etc. Do not underestimate the importance of clerical support.

- **Each Division will allocate funding for Ecounit Teams based on each Division's annual work plans.** This is the same as the current work planning/budget process. There may be instances where there is a need for shared expenses not covered by each Division's budget allotments. Requests for these funds should be directed to the Statewide Council.
- **Ecounit Teams will provide the Statewide Council a plan for implementing these charges by May 1, 2001.** The Canadians use "Terms of Reference" for this process and the EUP developed a draft that could be shared with the NLP.

The Michigan DNR is one of the first state agencies in the country to undertake an integrated ecosystem approach to resource planning and management on such a large scale. We expect the process to be adaptive and innovative. The Ecounit Teams are not expected to develop identical assessment and planning processes but they must be based on the concepts of resource sustainability, incorporate the elements of ecosystem management and be a fully open and participative public process. The Council recognizes that these charges will raise additional questions and that there is no blueprint for success. The Statewide Council looks forward to working with the Ecounit Teams to resolve outstanding issues and plan for the sustainable management of Michigan's natural resources.

Appendix C - Part 525, Statewide Forest Resources Plan, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Act No. 125
Public Acts of 2004
Approved by the Governor
May 28, 2004
Filed with the Secretary of State
May 28, 2004
EFFECTIVE DATE: May 28, 2004

STATE OF MICHIGAN
92ND LEGISLATURE
REGULAR SESSION OF 2004

Introduced by Reps. Casperson, Stahl, Pastor, Sheen, Walker, Pappageorge, Shackleton, Amos, Nofs, Meyer, Huizenga, Nitz, Palsrok, Palmer, Emmons, LaJoy, Voorhees, Moolenaar, Ward, Bisbee, Hune, Farhat, Mortimer, Hummel, Caswell, Robertson, Shaffer, DeRoche, Julian, Taub, Richardville, Vander Veen, Brandenburg, Acciavatti, Drolet and Bradstreet

ENROLLED HOUSE BILL No. 5554

AN ACT to amend 1994 PA 451, entitled "An act to protect the environment and natural resources of the state; to codify, revise, consolidate, and classify laws relating to the environment and natural resources of the state; to regulate the discharge of certain substances into the environment; to regulate the use of certain lands, waters, and other natural resources of the state; to prescribe the powers and duties of certain state and local agencies and officials; to provide for certain charges, fees, and assessments; to provide certain appropriations; to prescribe penalties and provide remedies; to repeal certain parts of this act on a specific date; and to repeal certain acts and parts of acts," by amending the heading to part 525 and section 52501 (MCL 324.52501), as added by 1995 PA 57, and by adding sections 52502, 52503, 52504, 52505, and 52506.

The People of the State of Michigan enact:

PART 525 SUSTAINABLE
FORESTRY ON STATE FORESTLANDS

Sec. 52501. As used in this part:
(a) "Breast height" means 4.5 feet from highest ground at the base of the tree.
(b) "Certification" means a process where an independent third party organization assesses and evaluates forest management practices according to the standards of a certification program resulting in an issuance of a certificate of compliance or conformity.
(c) "Certification program" means a program that develops specific standards that measure whether forest management practices are consistent with principles of sustainable forestry.
(d) "Conservation" means the wise use of natural resources.
(e) "Diameter class specifications" means a classification of trees based on the diameter at breast height.
(f) "Plan" means the forestry development, conservation, and recreation management plan for state forests as provided for in section 52503.
(g) "Reforestation" means adequate stocking of forestland is assured by natural seeding, sprouting, suckering, or by planting seeds or seedlings.
(h) "Residual basal area" means the sum of the cross-sectional area of trees 4 inches or greater in diameter measured at breast height left standing within a stand after a harvest.
(i) "State forest" means state land owned or controlled by the department that is designated as state forest by the director.
(j) "Sustainable forestry" means forestry practices that are designed to meet present and future needs by employing a land stewardship ethic that integrates the reforestation, managing, growing, nurturing, and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat, and visual qualities.

Sec. 52502. The department shall manage the state forest in a manner that is consistent with principles of sustainable forestry and in doing so shall do all of the following:
(a) Manage forests with consideration of its economic, social, and environmental values by doing all of the following:
(*i*) Broaden the implementation of sustainable forestry by employing an array of economically, environmentally, and socially sound practices in the conservation of forests, using the best scientific information available.
(*ii*) Promote the efficient utilization of forest resources.
(*iii*) Broaden the practice of sustainable forestry by cooperating with forestland owners, wood producers, and consulting foresters.
(*iv*) Plan and manage plantations in accordance with sustainable forestry principles and in a manner that complements the management of and promotes the restoration and conservation of natural forests.
(b) Conserve and protect forestland by doing all of the following:
(*i*) Ensure long-term forest productivity and conservation of forest resources through prompt reforestation, soil conservation, afforestation, and other measures.
(*ii*) Protect the water quality in streams, lakes, and other waterbodies in a manner consistent with the department's best management practices for water quality.
(*iii*) Manage the quality and distribution of wildlife habitats and contribute to the conservation of biological diversity by developing and implementing stand and landscape-level measures that promote habitat diversity and the conservation of forest plants and animals including aquatic flora and fauna and unique ecosystems.
(*iv*) Protect forests from wildfire, pests, diseases, and other damaging agents.
(*v*) Manage areas of ecologic, geologic, cultural, or historic significance in a manner that recognizes their special qualities.
(*vi*) Manage activities in high conservation value forests by maintaining or enhancing the attributes that define such forests.
(c) Communicate to the public by doing all of the following:
(*i*) Publicly report the department's progress in fulfilling its commitment to sustainable forestry.
(*ii*) Provide opportunities for persons to participate in the commitment to sustainable forestry.
(*iii*) Prepare, implement, and keep current a management plan that clearly states the long-term objectives of management and the means of achieving those objectives.
(d) Monitor forest management by promoting continual improvement in the practice of sustainable forestry and monitoring, measuring, and reporting performance in achieving the commitment to sustainable forestry.
(e) Consider the local community surrounding state forestland by doing both of the following:
(*i*) Require that forest management plans and operations comply with applicable federal and state laws.
(*ii*) Require that forest management operations maintain or enhance the long-term social and economic well-being of forest workers and local communities.

Sec. 52503. (1) The department shall adopt a forestry development, conservation, and recreation management plan for state owned lands owned or controlled by the department. Parks and recreation areas, state game areas, and other wildlife areas on these lands shall be managed according to their primary purpose. The department may update the plan as the department considers necessary or appropriate. The plan and any plan updates shall be consistent with section 52502 and shall be designed to assure a stable, long-term, sustainable timber supply from the state forest as a whole.
(2) The plan and any plan updates shall include all of the following:
(a) An identification of the interests of local communities, outdoor recreation interests, the tourism industry, and the forest products industry.
(b) An identification of the annual capability of the state forest and management goals based on that level of productivity.
(c) Methods to promote and encourage the use of the state forest for outdoor recreation, tourism, and the forest products industry.
(d) A landscape management plan for the state forest incorporating biodiversity conservation goals, indicators, and measures.
(e) Standards for sustainable forestry consistent with section 52502.
(f) An identification of environmentally sensitive areas.
(g) An identification of the need for forest treatments to maintain and sustain healthy, vigorous forest vegetation and quality habitat for wildlife and environmentally sensitive species.
Sec. 52504. (1) After the plan is adopted under section 52503, the department shall harvest timber from the state forest and other state owned lands owned or controlled by the department in compliance with the plan and any plan updates.

(2) Unless otherwise dedicated by law, proceeds from the sale of timber from the state forest and other state owned lands owned or controlled by the department shall be forwarded to the state treasurer for deposit into the forest development fund established pursuant to section 50507.

Sec. 52505. (1) The department shall seek and maintain third-party certification that the management of the state forest and other state owned lands owned or controlled by the department satisfies the sustainable forestry standards of at least 1 credible nonprofit, nongovernmental certification program and this part.
(2) Beginning January 1, 2006, the department shall ensure that the state forest is certified as provided for in subsection (1).
(3) Beginning the effective date of the amendatory act that added this section, the department shall commence a review and study to determine the appropriateness of certifying parks and recreation areas, state game areas, and other wildlife areas on state owned lands owned or controlled by the department. Not later than 1 year after the effective date of the amendatory act that added this section, the department shall report and recommend to the legislature the appropriateness and feasibility of certifying those lands.

Sec. 52506. By January 1 of each year, the department shall prepare and submit to the commission of natural resources, the standing committees of the senate and the house of representatives with primary jurisdiction over forestry issues, and the senate and house appropriations committees a report that details the following from the previous state fiscal year:
(a) The number of harvestable acres in the state forest as determined by the certification program under section 52506.
(b) The number of acres of the state forest that were harvested and the number of cords of wood that were harvested from the state forest.
(c) The number of acres of state owned lands owned or controlled by the department other than state forestlands that were harvested and the number of cords of wood that were harvested from those lands.
(d) Efforts by the department to promote recreational opportunities in the state forest.
(e) Information on the public's utilization of the recreational opportunities offered by the state forest.
(f) Efforts by the department to promote wildlife habitat in the state forest.
(g) The status of the plan and whether the department recommends any changes in the plan.
(h) Status of certification efforts required in section 52505 and, beginning in 2006, a definitive statement of whether the department is maintaining certification of the entire state forest.
(i) A description of any activities that have been undertaken on forest pilot project areas described in section 52511.

Enacting section 1. This amendatory act does not take effect unless all of the following bills of the 92nd Legislature are enacted into law:
(a) Senate Bill No. 1023.
(b) Senate Bill No. 1024.

This act is ordered to take immediate effect.

PRINCIPLE 7
MANAGEMENT PLAN

A management plan -- appropriate to the scale and intensity of the operations -- shall be written, implemented, and kept up to date. The long-term objectives of management, and the means of achieving them, shall be clearly stated.

7.1. The management plan and supporting documents shall provide:

a) Management objectives.
b) Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands.
c) Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories.
d) Rationale for rate of annual harvest and species selection.
e) Provisions for monitoring of forest growth and dynamics.
f) Environmental safeguards based on environmental assessments.
g) Plans for the identification and protection of rare, threatened and endangered species.
h) Maps describing the forest resource base including protected areas, planned management activities and land ownership.
i) Description and justification of harvesting techniques and equipment to be used.

Applicability Note: The management plan may consist of a variety of documents not necessarily unified into a single planning document but which represents an integrated strategy for managing the forest within the ecological, economic, and social limitations of the land. The plan includes a description and rationale for management elements appropriate to the scale, intensity, and goals of management, and may include:

Silvicultural systems
Regeneration strategies
Maintenance of structural and species diversity
Pest control (disease, insects, invasive species, and vegetation)
Soil and water conservation
Methods and annual rates of harvest, by species and products
Equipment and personnel needs
Transportation system
Fire management
Prescribed fires
Wildfires
Fish and wildlife and their habitats (including non-game species)
Non-timber forest products
Methods and annual rates of harvest, by species and products
Regeneration strategies
Socioeconomic issues
Public access and use
Conservation of historical and cultural resources
Protection of aesthetic values
Employee and contractor policies and procedures
Community relations

Stakeholder notification
Public comment process
For public forests, legal and historic mandates
American Indian issues
Protection of legal and customary rights
Procedures for integrating tribal concerns in forest management
Management of sites of special significance
Special management areas
High Conservation Value Forests
Riparian management zone
Set asides of samples of representative existing ecosystems
Sensitive, rare, threatened, and endangered species protection
Other protected areas
Landscape level analyses and strategies

7.1.a. Management objectives

7.1.a.1. A written management plan is prepared that includes the landowner's short-term and long-term goals and objectives (ecological, social, and economic). The objectives are specific, achievable, and measurable.

7.1.a.2. The management plan describes desired future conditions that will meet the long-term goals and objectives and that determine the silvicultural system(s) and management activities to be used.

7.1.b. Description of forest resources to be managed, environmental limitations, land use and ownership status, socioeconomic conditions, and profile of adjacent lands

7.1.b.1. The management plan describes the timber, fish and wildlife, harvested nontimber forest products, soils, and non-economic forest resources.

7.1.b.2. The management plan includes descriptions of special management areas; sensitive, rare, threatened, and endangered species and their habitats; and other ecologically sensitive features in the forest.

7.1.b.3. The management plan includes a description of past land uses and incorporates this information into the vision, goals, and objectives.

7.1.b.4. The management plan identifies the legal status of the forest and its resources (e.g., ownership, usufruct rights (see Glossary), treaty rights, easements, deed restrictions, and leasing arrangements).

7.1.b.5. The management plan identifies relevant cultural and socioeconomic issues (e.g., traditional and customary rights of use, access, recreational uses, and employment), conditions (e.g., composition of the workforce, stability of employment, and changes in forest ownership and tenure), and areas of special significance (e.g., ceremonial and archeological sites).

7.1.b.6. The management plan incorporates landscape-level considerations within the ownership and among adjacent and nearby lands, including major bodies of water, critical habitats, and riparian corridors shared with adjacent ownerships.

7.1.c. Description of silvicultural and/or other management system

7.1.c.1. Silvicultural system(s) and prescriptions are based on the integration of ecological and economic characteristics (e.g., successional processes, soil characteristics, existing species composition and structures, desired future conditions, and market conditions). (see also sub-Criterion 6.3.a)

7.1.c.2. Prescriptions are prepared prior to harvesting, site preparation, pest control, burning, and planting and are available to people who implement the prescriptions.

7.1.d. Rationale for the rate of annual harvest and species selection

7.1.d.1. Calculations for the harvests of both timber and non-timber products are detailed or referenced in the management plan and are based on net growth, yield, stocking, and regeneration data. (see also 5.6.b)

7.1.d.2. Species selection meets the social and economic goals and objectives of the forest owner or manager and leads to the desired future conditions while maintaining or improving the ecological composition, structures, and functions of the forest.

7.1.d.3. The management plan addresses potentially disruptive effects of pests, storms, droughts, and fires as they relate to allowable cut.

7.1.e. Provisions for monitoring forest growth and dynamics (see also Principle 8)

7.1.e.1. The management plan includes a description of procedures to monitor the forest.

7.1.f. Environmental safeguards based on environmental assessments (see also Criterion 6.1.)

7.1.g. Plans for the identification and protection of rare, threatened, and endangered species. (see also Criterion 6.3.)

7.1.h. Maps describing the forest resource base including protected areas, planned management activities, and land ownership.

7.1.h.1. The management plan includes maps of such forest characteristics as: relevant landscape-level factors; property boundaries; roads; areas of timber production; forest types by age class; topography; soils; riparian zones; springs and wetlands; archaeological sites; areas of cultural and customary use; locations of sensitive, rare, threatened, and/or endangered species and their habitats; and designated High Conservation Value Forests.

7.1.i. Description and justification of harvesting techniques and equipment to be used. (see also Criterion 6.5)

7.1.i.1. Harvesting machinery and techniques are discussed in the management or harvest plan and are specifically matched to forest conditions in order to minimize damage.

7.1.i.2. Conditions for each timber sale are established by a timber sale contract or written harvest prescription and accompanying timber sale map.

7.2. The management plan shall be periodically revised to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.

7.2.a. Operational components of the management plan are reviewed and revised as necessary or at least every 5 years. Components of the long-term (strategic) management plan are revised and updated at the end of the planning period or when other changes in the management require it. (see also Criterion 8.4)

7.3. Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plans.

7.3.a. The forest owner or manager assures that workers are qualified to implement the management plan (see also Criterion 4.2).
7.3.b. The management plan is understandable, comprehensive, and readily available to field personnel.

7.4. While respecting the confidentiality of information, forest managers shall make publicly available a summary of the primary elements of the management plan, including those listed in Criterion 7.1.
Applicability Note: Forest owners or managers of private forests may withhold proprietary information (e.g., the nature and extent of their forest resource base, marketing strategies, and other financial information). (see also Criterion 8.5)
7.4.a. A management plan summary that outlines management objectives (from sub-Criterion 7.1.a.), whether on private lands or the land pool under a resource manager, is available to the public at a reasonable fee. Additional elements of the plan may be excluded, to protect the security of environmentally sensitive and/or proprietary information.
7.4.b. Managers of public forests make forestry-related information easily accessible (e.g., available on websites) for public review, including that required by Criterion 7.1.

Appendix E - Excerpts of planning objectives from the SFI Standards.

Objective 1. To broaden the implementation of *sustainable forestry* **by ensuring long-term harvest levels based on the use of the** *best scientific information* **available.**

Performance Measure 1.1. *Program Participants* shall ensure that long-term harvest levels are sustainable and consistent with appropriate *growth-and-yield models* and written plans.

Indicators:
1. A long-term resource analysis to guide forest management planning at a level appropriate to the size and scale of the operation, including
a. a periodic or ongoing forest *inventory*;
b. a *land classification* system;
c. soils *inventory* and maps, where available;
d. access to *growth-and-yield modeling* capabilities;
e. up-to-date maps or a *geographic information system (GIS)*;
f. recommended sustainable harvest levels; and
g. a review of nontimber issues (e.g., pilot projects and economic incentive programs to promote water protection, carbon storage, or *biological diversity conservation*).
2. Documentation of annual harvest trends in relation to the sustainable forest management plan.
3. A forest *inventory* system and a method to calculate growth.
4. Periodic updates of *inventory* and recalculation of planned harvests.
5. Documentation of forest practices (e.g., planting, fertilization, and thinning) consistent with assumptions in harvest plans.

Objective 12. To broaden the practice of *sustainable forestry* **by encouraging the public and forestry community to participate in the commitment to** *sustainable forestry* **and publicly report progress.**

Performance Measure 12.3. *Program Participants* with forest *management responsibilities on public lands* shall participate in the development of *public land* planning and management processes.

Indicators:
1. Involvement in *public land* planning and management activities with appropriate governmental entities and the public.
2. Appropriate contact with local stakeholders over forest management issues through state, provincial, federal, or independent collaboration.

Objective 13. To promote continual improvement in the practice of *sustainable forestry* **and monitor, measure, and report performance in achieving the commitment to** *sustainable forestry***.**

Performance Measure 13.1. *Program Participants* shall establish a management review system to examine findings and progress in implementing the SFI Standard, to make appropriate improvements in *programs*, and to inform their employees of changes.

Indicators:
1. System to review commitments, *programs*, and procedures to evaluate effectiveness.
2. System for collecting, reviewing, and reporting information to management regarding progress in achieving SFI Standard *objectives* and *performance measures*.
3. Annual review of progress by management and determination of changes and improvements necessary to continually improve SFI conformance.

The core team is comprised of each division's "District" supervisor and is responsible for the resource decisions that will come before the team. Responsibilities also include assuring staff assistance from their respective field personnel and securing the monies needed for plan implementation. By having each division represented, the scope of the team embraces the Department's mission of managing all of the state's resources in a holistic manner.

Core Team Members

John Cischke, Law Enforcement Division, Newberry Operations Service Center (OSC)
Gary Ellenwood, Parks and Recreation Division, Newberry OSC
Ann Mattson, Field Operations Services, Newberry OSC
Robert Moody, Fisheries Division, Newberry OSC
Rex Ainslie, Wildlife Division, Newberry OSC
Michael Paluda, (Acting) Forest, Minerals and Fire Management Division, Marquette OSC

The support team responsibilities are to provide the core team with information necessary to make resource management decisions, plan development, and monitoring. Each support team member brings skills and information to assist the core team with decision making and Ecoregional Planning.

Support Team Members

Sherry MacKinnon, EUP Wildlife Ecologist, Newberry OSC
Darrell Welch, EUP Inventory and Planning Specialist, Newberry OSC
Richard Stevenson, EUP Cooperative Forest Management Specialist, Newberry OSC
Matt Tonello, Department Of Information and Technology, Roscommon OSC

CRITERION 1 Conservation of Biological Diversity

Biological diversity, or biodiversity, is the variability among living organisms and the ecological systems of which they are a part. Biodiversity can be measured at the landscape, ecosystem, species and genetic levels. The conservation of biodiversity ensures that all ecosystems maintain their integrity and continue to be productive and to adapt to changing conditions.

INDICATOR 1.1 Landscape and Ecosystem Diversity

The complexity of landscapes is determined by the number of patches, their characteristics, their size and shape and their connectivity. Ecosystem diversity is the kind and number of ecosystems in an area and the patterns of association of ecosystems with one another and the recurrence of these patterns in a given landscape. The impacts of change in landscapes are expressed through shifts in ecosystem diversity.

METRIC *1.1.1* *Percentage and extent of vegetation types relative to historical conditions (at varying scales)*

METRIC *1.1.2* *Richness and evenness of ecosystems or vegetation types (By age class for forested systems)*

METRIC *1.1.3* *Richness and evenness of glacial landforms or soil types and index of topographic heterogeneity*

METRIC *1.1.4* *Percentage, area, and representativeness of vegetation types in designated protected areas of natural and scientific interest*

METRIC *1.1.5* *Level of fragmentation, connectivity, shape, size and spatial distribution of vegetation types*

METRIC *1.1.6* *Connectivity of glacial landforms and/or soil types*

METRIC *1.1.7* *Number, area and distribution of unusual or rare vegetation types*

INDICATOR 1.2 Species Population Diversity

Species diversity refers to the number and relative abundance of species found in an area. The impacts of change in ecosystems are expressed through shifts in species biodiversity.

METRIC *1.2.1* *Absolute and relative abundance of habitat types and their importance for focal species..*

METRIC *1.2.2* *Changes in habitat of focal species.*

METRIC *1.2.3* *Species classified as threatened, endangered, rare or vulnerable and their population sizes and habitat condition*

METRIC *1.2.4* *Number of known species that occupy a smaller portion of their former range and the number of known species that occupy a larger portion of their former range*

METRIC *1.2.5* *Species richness of all plants, animals and fungi within representative*

ecosystems

INDICATOR 1.3 Genetic Diversity

Genetic diversity includes the range of genetic characteristics found within a species and among different species.

METRIC *1.3.1* *Proportion of forest area as plantations using native vs. non-native genotypes*

METRIC *1.3.2* *Proportion of water bodies using native vs. non-native fish stock genotypes*

METRIC *1.3.3* *Proportion of water bodies with sustainable fisheries produced by stocked vs. natural reproduction*

METRIC *1.3.4* *Proportion of planted openings on managed lands with native vs. non-native species*

CRITERION 2 Ecosystem Condition and Productivity

Ecosystem condition is a measure of relative freedom from stress and the relative level of physical/biological energy within an ecosystem. Ecosystem productivity refers to the rate of production of organic matter within an ecosystem. This results from interactions between biological components and abiotic factors such as soil, water and climate. Sustainable productivity is dependent upon the ability of ecosystems to recover from or adapt to disturbances; both natural and human induced. A healthy and diverse ecosystem is better able to respond to and recover from changes in its environment.

INDICATOR 2.1 Incidence of Disturbance and Stress

Ecosystem change is constant. Many of these changes are adaptations to disturbance. Disturbances generally cause ecosystems to revert to earlier successional stages or establish new patterns of succession. Fundamental to the continued health, vitality and productivity of ecosystems are their ability to adapt to the various stresses placed upon them. Disturbances may be part of natural ecological cycles or the result of human activities. Human-induced stress and disturbance include introduced (exotic) species, prescribed burning, fire suppression, populations out of balance with available habitat, pollution and land-use practices. Natural disturbances include native insects, high wind events and fire.

METRIC *2.1.1* *Area and severity of forest stressor*

METRIC *2.1.2* *Area and severity of wind and fire activity*

METRIC *2.1.3* *Presence, extent and number of invasive exotic species*

METRIC *2.1.4* *Presence, extent of disease*

METRIC *2.1.5* *Area and severity of mammalian herbivory*

METRIC *2.1.6* *Area and intensity of timber harvest*

METRIC *2.1.7* *Land clearing/urban sprawl*

INDICATOR 2.2 Ecosystem Resilience

Resilience is a measure of an ecosystems' ability to maintain its natural range of variability given its disturbance regime and other dynamics. Resilience reflects the persistence of ecosystems and their capacity to respond to changes and disturbances.

METRIC *2.2.1* *Area by vegetation type and age class*

METRIC *2.2.2* *Area successfully regenerated by vegetation type*

METRIC *2.2.3* *Ecological function, activity and responses to perturbation within "protected areas"*

METRIC *2.2.4* *Distribution and abundance of top carnivores.*

METRIC *2.2.5* *Distribution and abundance of mammalian herbivores*

METRIC *2.2.6* *Ratio of exotic invasive plant species to native plant species in natural vegetative communities*

METRIC *2.2.7* *Presence of spring ephemerals*

INDICATOR 2.3 Biomass

Biomass represents the total mass of living organisms inherent in an ecosystem. It is an integrating measure of ecosystem condition (health and vitality of all species and habitat types). Evidence that the condition of habitat types is constant or improving indicates that they are being managed in a sustainable way. In this case, we are measuring
forest productivity.

METRIC *2.3.1* *Mean annual increment by forest type and age class*

METRIC *2.3.2* *Net annual growth by forest type and age class for the EUP*

METRIC *2.3.3* *Biomass volumes of standing flora.*

INDICATOR 2.4 Ecosystem Structure

Vegetation and other biotic and abiotic materials provide the physical structure within which most organisms live. Ecosystem structure includes the presence and arrangement of these physical structures in three dimensional space. Species richness in some taxa is correlated with ecosystem community structure.

FORESTED ECOSYSTEMS

METRIC *2.4.1* *Number of super canopy trees*

METRIC *2.4.2* *Snags per area, basal area, mean DBH and decay class*

METRIC *2.4.3* *Cavities per area by size class*

METRIC *2.4.4* *Coarse woody debris per area, mean DBH and decay class*

METRIC *2.4.5* *Number of vertical vegetation layers per area*

METRIC *2.4.6* *Number and size of tree fall gaps, harvest gaps and maintained wildlife openings per area in northern hardwood ecosystems*

METRIC *2.4.7* *Tree size: basal area per acre/hectare for different forested communities*

METRIC *2.4.8* *Distribution of cliffs, outcrops, sinks and glacial erratics*

METRIC *2.4.9* *Number of vertical vegetation layers per area*

METRIC *2.4.10* *Ratio of open water to emergent vegetation in wetlands*

AQUATIC ECOSYSTEMS

METRIC *2.4.11* *Surface and sub-surface geology of valley segment*

METRIC *2.4.12* *Number of vertical vegetation layers by valley segment*

METRIC *2.4.13* *Surface and sub-surface hydrology of valley segment*

METRIC *2.4.14* *Coarse woody debris per area, mean DBH and decay class*

METRIC *2.4.15* *Bathymetric shape of lakes*

METRIC *2.4.16* *Aquatic plant abundance and distribution*

CRITERION 3 Water and Soil Conservation

Water and Soil are essential to sustaining the functioning and productive capacity of ecosystems. Water conservation is an important provision of suitable aquatic environments for plants and animals, and for the provision of potable water for humans and wildlife; whereas, soil conservation is the maintenance of the living substrate for forests, shrubs and grasslands.

INDICATOR 3.1 Water Quality

Long term productivity and resilience of habitats, and a potable water supply for humans and wildlife, are dependent upon an abundant and clean water source. In order to ensure that aquatic ecosystems are maintained, policies that address stream crossings, watershed management and riparian areas will help maintain water flow patterns, water levels and water quality.

SURFACE WATER METRICS

METRIC *3.1.1* *Percent of rural/urban land managed for water conservation (watershed quality)*

METRIC *3.1.2* *Water chemistry (pH, dissolved O^2, water conductivity, turbidity and water temperatures) and volume flow*

METRIC *3.1.3* *Fecal coliform*

METRIC *3.1.4* *Nutrients (nitrates and phosphates)*

METRIC *3.1.5* *Fish species diversity*

METRIC *3.1.6* *Benthic species diversity*

METRIC *3.1.7* *Number of water crossings per unit area*

METRIC *3.1.8 Pesticide residue concentrations in surface water*

METRIC *3.1.9 Area of wetlands*

METRIC *3.1.10 Surface withdrawals by volume*

GROUND WATER METRICS

METRIC *3.1.11 Ground Water Recharge Zones*

METRIC *3.1.12 Ground water elevations*

METRIC *3.1.13 Quality of drinking water*

METRIC *3.1.14 Total water wells abandoned due to man-made contaminants*

METRIC *3.1.15 Sub-surface withdrawals by volume*

INDICATOR 3.2 Soil Conservation

The long-term productivity and resilience of forests and other habitats are dependent upon the maintenance of appropriate levels of soil oxygen, nutrients and organic matter. In order to ensure that terrestrial and aquatic ecosystems are maintained and improved, policies must be enacted to provide for specific management practices or the protection of sensitive sites.

METRIC *3.2.1 Area of lands managed for soil conservation (reflects the fragility of the soil on some sites))*

METRIC *3.2.2 Soil stability and productivity (pH, soil faunal and fungal activity, soil erosion, degradation indices)*

METRIC *3.2.3 Area of vegetated riparian corridors*

CRITERION 4 Ecological Cycles

Ecological cycles are a complex of self-regulating processes responsible for recycling the earth's limited supplies of water, carbon, nitrogen and other elements necessary to sustain life. Understanding the role that local systems play in these global cycles is essential for the development of sound ecosystem management and sustainability.

INDICATOR 4.1 Carbon Cycle

The global carbon cycle represents an important set of processes linking plant and animal communities with climate change. The release or removal of CO2 to and from the atmosphere impacts on global ecological cycles. Forests, wetlands and water bodies can act as either sinks (a vigorous and growing forest) or sources for atmospheric carbon, depending on whether they are primarily storing carbon or releasing it. Knowledge of the influence of natural disturbances and human intervention on this role can indicate the type of forest practices required for sustainable management.

METRIC *4.1.1 Area of forest permanently, semi-permanently, or temporarily converted to non-forest land use*

METRIC *4.1.2 Carbon pool in forest products*

METRIC *4.1.3 Carbon pools in soils*

METRIC *4.1.4 Amount of fuels consumed*

METRIC *4.1.5 Fuelwood consumption/atmospheric*

INDICATOR 4.2 Hydrological Cycle

Hydrological cycles involve the movement of water from the atmosphere to the surface of the earth in the form of precipitation; from soils to streams to lakes; and from soil to plants to the atmosphere. Because of their vast area in the EUP, forests play a major role in Great Lakes hydrological cycles. Changes in forestland cover and management influence the storage and movement of water and the timing of the various components of the hydrological cycle. The forest can regulate the flow of water into lakes and wetlands directly or by influencing stream and river flows. Consequently, sustainable forest management plays a crucial role in contributing to the regulation of the hydrological cycle.

METRIC *4.2.1 Number, distribution and acres of impoundments affected by natural and artificial water control structures*

METRIC *4.2.2 Surface area of lakes and wetlands; total flow data for rivers and streams*

METRIC *4.2.3 Changes in Great Lakes water levels*

METRIC *4.2.4 Annual precipitation*

METRIC *4.2.5 Groundwater withdrawals*

METRIC *4.2.6 Great Lakes water withdrawals*

METRIC *4.2.7 Acres of artificially created surface*

CRITERION 5 Uncommon or Rare Natural Features

Identification and recognition of uncommon geological sites, plant and animal species, and ecological communities can make a difference between success and failure at sustaining our heritage and protection of natural systems over the long run.

INDICATOR 5.1 Uncommon or Rare Vegetation Types

METRIC *5.1.1 Type, area, distribution and quality of uncommon or rare vegetation types. Size and distribution of uncommon or rare habitat types*

METRIC *5.1.2 Type, area, distribution and representativeness of uncommon or rare vegetation types and their protection status (i.e. protected areas Natural areas, Old growth, Wild and Scenic Rivers, State Parks*

METRIC *5.1.3 Type, area and distribution of uncommon or rare vegetation types under active management*

METRIC *5.1.4 Availability of critical fisheries habitat to support natural reproduction*

METRIC *5.1.5 Miles of undeveloped Great Lakes shoreline, inland lakes and water courses*

INDICATOR 5.2 Uncommon or Rare Species

METRIC *5.2.1* *Population levels, habitat distribution and changes over time of selected uncommon or rare species (species will need to be selected)*

METRIC *5.2.2* *Number of species classified as threatened, endangered, rare or vulnerable relative to the total number of known species by taxa*

INDICATOR 5.3 Geophysical and Hydrophysical Features

METRIC *5.3.1* *Number, location and protection status of physical features and landforms (karsts, dunes, rock outcrops, eskers, drumlins, moraines, fossil beds)*

METRIC *5.3.2* *Number of unique water features: aquifers, artesian wells, springs, waterfalls, recharge zones.*

CRITERION 6 Social / Cultural

The Eastern Upper Peninsula Ecoregion is a predominantly rural and natural resource rich region of Northern Michigan. This has provided a context for the social-cultural values of communities that make the sustainability of resources essential to the social and cultural fabric of the region. People who live in the Ecoregion point to the importance of their lifestyles and the strong connection with the land.

INDICATOR 6.1 Stability of Land Use

METRIC *6.1.1* *Percentage of lands that are under alteration by vegetative type*

METRIC *6.1.2* *Area of lands under restoration by vegetative type*

METRIC *6.1.3* *Amount of change of ownership*

METRIC *6.1.4* *Amount of ownership fragmentation and parcelization of land*

METRIC *6.1.5* *Traditional non-profit uses for cultural forest products (e.g.berries, syrup, mushrooms, black ash, cattails, etc.)*

METRIC *6.1.6* *Number and size of forested parcels that have been added to or removed from the Commercial Forest Program*

INDICATOR 6.2 Place for Nature and Scientific Study

METRIC *6.2.1* *Area and vegetation types in areas of natural and scientific interest*

METRIC *6.2.2* *Number of educational and recreational opportunities*

METRIC *6.2.3* *Presence of natural features, plant species and wildlife species important to the identity of area*

INDICATOR 6.3 Archaeology and History

Resource management planning takes into account the identification and protection of known unique or significant Native American, Euro American, social, cultural and or spiritual sites.

METRIC *6.3.1* *Archaeological Site Potential.*

METRIC *6.3.2* *Presence of a known archaeological site (more weight can be given to sites that are on the National Register of Historic Places, this register includes prehistoric sites as well).*

METRIC *6.3.3* *Presence of an area(s) of Historical/Cultural Significance (many times these areas may show no visible signs of their significance, e.g. a Native American Indian trail corridor where the trail is no longer visible, or a spot at which a meeting or discovery took place).*

METRIC *6.3.4* *Presence of spiritual/ceremonial activities.*

INDICATOR 6.4 Presence of Local Planning Efforts for the Sustainability of Natural Resources and Communities

METRIC *6.4.1* *Percent of townships addressing sustainability of natural resources and communities.*

METRIC *6.4.2* *Percent of counties addressing sustainability of natural resources and communities.*

METRIC *6.4.3* *Presence of regional or watershed area planning efforts*

CRITERION 7 Spiritual

Spiritual values are personal feelings and sentiments that natural resources engender to the human spirit and are a reason for sustaining the landscape to provide those experiences. Because the essence here is personal and to a large degree intangible, the indicators pertain to the features of the ecosystem which are most evocative to the senses and secondly, which pertain to the ability of people to use those resources.

INDICATOR 7.1 Undeveloped Natural Resources

METRIC *7.1.1* *Size and distribution of natural and 'special management' areas and allowed use of those areas*

METRIC *7.1.2* *Road and motorized trail density*

METRIC *7.1.3* *Density and distribution of dwellings and commercial structures*

METRIC *7.1.4* *Measure / monitor distribution of undeveloped areas in populated areas*

INDICATOR 7.2 Aesthetics

METRIC *7.2.1* *Area and distribution of "secluded" natural resources.*

METRIC *7.2.2* *Presence of litter or trash dumped on public land*

METRIC *7.2.3* *Number of designated access opportunities to view scenic vistas and/or wildlife*

METRIC *7.2.4* *Miles of road by use class, distribution and density in EUP*

METRIC *7.2.5* *Visual management OI – Travel Influence Zones*

METRIC *7.2.6* *Emotional/intrinsic values (Are my needs being met?)*

CRITERION 8 Recreation

An activity pursued during leisure time and by free choice that provides its own satisfaction.

INDICATOR 8.1 Hunting, Trapping and Fishing

METRIC *8.1.1* *User days/ activity*

METRIC *8.1.2* *Satisfaction levels*

METRIC *8.1.3* *Population health by species*

METRIC *8.1.4* *Population density by species*

METRIC *8.1.5* *Harvest number by species*

METRIC *8.1.6* *Number and distribution of shooting ranges*

METRIC *8.1.7* *Amount of Commercial Forest (CF) lands, changes in status*

METRIC *8.1.8* *Law Enforcement activity – number of warnings, summons, arrests per activity*

METRIC *8.1.9* *Number of safety training opportunities per activity*

METRIC *8.1.10* *Accident trends per activity per season*

INDICATOR 8.2 Designated Trails – Motorized and Non-motorized (hiking, RV, snowmobile, skiing, equestrian)

METRIC *8.2.1* *Infrastructure and resources available for trail maintenance*

METRIC *8.2.2.* *User days per activity*

METRIC *8.2.3* *Miles of trail systems by trail ownership and management type*

METRIC *8.2.4* *Percentage of stream and wetland crossings complying with BMPs, laws and policies.*

METRIC *8.2.5* *Number of safety training opportunities per activity*

METRIC *8.2.6* *Accident trends per activity per season*

INDICATOR 8.3 Nature Appreciation and Education

METRIC *8.3.1* *Area of EUP by vegetation type, age class and ownership*

METRIC *8.3.2* *Miles of public Great Lakes shoreline, inland lakes and water courses*

METRIC *8.3.3* *Percentage, area and representativeness of vegetative types in areas of natural and scientific interest*

METRIC *8.3.4* *User days/activity*

METRIC *8.3.5* *Number of unique species observation opportunities*

METRIC *8.3.6* *Ecotour opportunities*

INDICATOR 8.4 Special Scenic Sites

METRIC *8.4.1* *Size and distribution of natural and 'special' areas and their allowed use*

METRIC *8.4.2* *Miles of designated scenic routes*

METRIC *8.4.3* *Number of designated viewing areas*

INDICATOR 8.5 Camping – Includes Dispersed and Designated Sites

METRIC *8.5.1* *Number, type and distribution of campground facilities- rustic, modern, semi-modern, cabins*

METRIC *8.5.2* *Number of campsites by type in campgrounds*

METRIC *8.5.3* *User days by campground and campsite*

METRIC *8.5.4* *Number of dispersed camps per year*

METRIC *8.5.5* *Environmental impact of camping Benchmarks: -Soil erosion from human use -Trash presence -Carrying capacity of facility vs. overuse*

INDICATOR 8.6 Water Recreation – Motorized and Non-motorized (including swimming, scuba diving, kayaking, etc.)

METRIC *8.6.1* *User days per activity (power/sail boating, jet-skis, canoes, rafting/tubing, kayaking, swimming, snorkeling, fishing, water skiing, boat races, cruise ships, sail boarding, etc)*

METRIC *8.6.2* *Number of water access sites and boat slips by type and capacity for watercraft and available amenities*

METRIC *8.6.3* *Change in status of water body designation and use*

METRIC *8.6.4* *Number of safety training opportunities per activity*

METRIC *8.6.5* *Accident trends per activity per season*

INDICATOR 8.7 Diversity of Recreational Opportunities: the availability of different ways for people to recreate on the landscape

METRIC *8.7.1* *Availability of recreational activities by type i.e. lakes, rivers, forest, parks*

METRIC *8.7.2* *Universal (barrier free) access to facilities*

METRIC *8.7.3* *Quality and satisfaction of recreational experience (would LED activity indicate quality?)*

METRIC *8.7.4* *Seasonally adjusted number of participants*

CRITERION 9 Ownership Patterns

The pattern and distribution of ownership and use of lands in the Eastern Upper Peninsula (EUP), plays a role in sustainable resources. Land ownerships can affect management options, resource demand and fragmentation. The success of sustainable management of Michigan's resources depends on making connections across disciplines, interest, boundaries and landscapes.

INDICATOR 9.1 Ownership types (the distribution and area of land by owner)

METRIC *9.1.1* *Percent of public and private ownership in EUP*

METRIC *9.1.2* *Changes in ownership by acres*

METRIC *9.1.3* *Distribution of ownership in the EUP by acres*

INDICATOR 9.2 Stewardship

Stewardship is the practice of carefully managing land usage to ensure natural systems are maintained or enhanced for future generations; to preserve the capacity of the land for self-renewal.

METRIC *9.2.1* *Number, acres and distribution of private land management plans and percent of private ownership with management plans*

METRIC *9.2.2* *Miles of Great Lakes shoreline, inland lakes and water courses under special management*

METRIC *9.2.3* *Number and location of conservation easements in EUP*

METRIC *9.2.4* *Number of cooperative planning "agreements" across ownerships in EUP*

METRIC *9.2.5* *Land use patterns across all ownerships*

INDICATOR 9.3 Accessibility

The extent to which a parcel or area of land can be reached and used by people.

METRIC *9.3.1* *Percent of public and private land in the EUP*

METRIC *9.3.2* *Number and location of easements across public lands*

METRIC *9.3.3* *Number and location of easements across private lands*

METRIC *9.3.4* *Number of acres of public land without access (landlocked by private ownerships)*

METRIC *9.3.5* *Number of acres of private land enrolled in the Commercial Forest Program (CF)*

METRIC *9.3.6* *Existence of a road maintenance plan and expenditures by agency*

METRIC *9.3.7* *Miles of road by use class, distribution and density in the EUP*

CRITERION 10 Economic Health

A wide range and services are derived from our natural resources that create opportunities for economic stability in the Eastern Upper Peninsula. In addition to traditional forest products sector, the resource base supports mining, commercial fishing and an ever-growing tourist and recreation industry.

INDICATOR 10.1 Local and Community Economic Health and Trends

METRIC *10.1.1* *Number of local economic development plans in the EUP Ecoregion*

METRIC *10.1.2* *Describe job/income /employment / retirement data*

METRIC *10.1.3* *Contribution of the resource use to gross domestic product (GDP) of all sectors of the economy*

METRIC *10.1.4* *Diversity of forest economic activity*

METRIC *10.1.5* *Measure change in the tax base*

METRIC *10.1.6* *Capital outlay and investment trends*

INDICATOR 10.2 Non-timber Economic Benefits

METRIC *10.2.1* *Number of jobs/economic activity (e.g. indirect service jobs, recreation/tourism, and rec. equipment) DIFFICULT TO MEASURE BUT MEASURABLE*

METRIC *10.2.2* *User days/activity DIFFICULT TO MEASURE BUT MEASURABLE*

METRIC *10.2.3* *Motel occupancy rates DIFFICULT TO MEASURE BUT MEASURABLE*

METRIC *10.2.4* *Mean and median travel spending per person per day per activity*

METRIC *10.2.5* *Total expenditures by individuals per activity in EUP*

INDICATOR 10.3 Timber and Wood Products

METRIC *10.3.1* *Timber volume, growth and mortality*

METRIC *10.3.2* *Timber harvest by species*

METRIC *10.3.3* *Legal and physical accessibility. Limit on timber availability for reasons of policy, legality, management decisions and physical access. CANNOT BE DONE*

METRIC *10.3.4* *Wood product summary*

METRIC *10.3.5* *Determine ratio of harvest to growth by volume, species and products*

METRIC *10.3.6 Wood budget – how much wood going out of the area*

METRIC *10.3.7 Net difference between growth and harvest by species.*

METRIC *10.3.8 Number of jobs/economic activity (e.g. logging, hauling, and mills)*

CRITERION 11 Institutional Processes

Institutional processes address the legal and institutional framework for the application of ecosystem management. They address the policies, legislation, regulations and guidelines that drive and direct ecosystem practices, and direct how institutions cooperate with others in the application of ecosystem management. Processes examine the quality and quantity of opportunities for public involvement in ecosystem planning leading to resource decisions.

INDICATOR 11.1 Legal Framework for Ecosystem Management

The framework should include the existence and/or application of laws, regulations, policy and guidelines for land management. Also, the framework should consider and meet legal obligations with respect to duly established Native American treaty rights.

METRIC *11.1.1 Land management laws and regulations.*

METRIC *11.1.2 Wildlife management laws and regulations.*

METRIC *11.1.3 Recreation laws and regulations.*

METRIC *11.1.4 Fisheries management laws and regulations.*

METRIC *11.1.5 Native American treaty rights.*

METRIC *11.1.6 Department & Division Policies and Procedures*

METRIC *11.1.7 Compliance with land management laws, regulations, policies and guidelines (LRPGs).*

INDICATOR 11.2 Institutional Framework

The framework should include the existence of audit or assessment programs, the existence of an integrated planning system and incorporate fair and effective decision making.

METRIC *11.2.1 Public participation in the design of decision-making processes*

METRIC *11.2.2 Public participation in decision-making processes*

METRIC *11.2.3 Public participation in implementation of decisions and monitoring*

INDICATOR 11.3 Balance Between Different Values

This indicator is to ensure that values identified as being important in the Eastern Upper Peninsula Ecoregion are not eliminated and that a dispute resolution policy be established to ensure balance between the values.

METRIC *11.3.1 Amount of management effort/interest put into different values*

METRIC *11.3.2 Annual evaluation and reporting of the ecosystem management effort in maintaining the values on the landscape and appropriate adjustments made.*

METRIC *11.3.3 Application and effectiveness of dispute resolution guidelines/policy*

INDICATOR 11.4 Resources Allocated for Ecosystem Management Values.

METRIC *11.4.1 Resources allocated within the Department for ecosystem management planning, implementation and monitoring*

METRIC *11.4.2 Participation in external planning efforts (e.g. National Forest Plan revisions)*

METRIC *11.4.3 Expenditure of resources and dedicated funds for "on the ground" Projects.*

Appendix H – 2006 Statewide and EUP Ecoregion Forest Types by Management Unit (in acres) (from DNR Inventory Data)

Cover Type	Statewide Total	Newberry	Sault Ste Marie	Shingleton	Ecoregion Total	Percent of State
Aspen	884,822	22,764	65,435	34,589	122,788	13.90%
Balsam Poplar Swamp	71,655	4,515	15,866	2,045	22,426	31.30%
Bedrock	1,065		79	56	135	12.70%
Black Spruce Swamp	68,636	11,272	10,003	15,578	36,853	53.70%
Bog or Marsh	35,163	3,438	5,784	2,785	12,007	34.10%
Cedar Swamp	228,397	19,034	51,801	28,675	99,510	43.60%
Emergent Marsh	113,355	23,275	8,809	37,677	69,761	61.50%
Grassland	125,288	4,743	12,486	24,766	41,995	33.50%
Hemlock	17,479	2,249	1,822	3,059	7,130	40.80%
Jack Pine	367,034	59,823	1,750	43,432	105,005	28.60%
Local Name	6,544	253	80	232	565	8.60%
Lowland Hardwoods	135,912	7,540	5,724	7,290	20,554	15.10%
Lowland Brush	197,448	20,951	23,727	32,187	76,865	38.90%
Mixed Swamp Conifers	261,183	33,291	16,921	19,135	69,347	26.60%
N. Hardwoods	508,302	37,745	43,164	48,345	129,254	25.40%
Non Stocked	22,791	592	995	2,043	3,630	15.90%
Oak	243,691	1,968	1,188	1,704	4,860	2.00%
Paper Birch	35,462	3,915	9,344	4,160	17,419	49.10%
Red Pine	279,973	23,880	16,197	37,699	77,776	27.80%
Sand Dune	1,106	504	137	138	779	70.40%
Spruce Fir	51,504	2,921	8,136	3,339	14,396	28.00%
Tamarack Swamp	22,256	1,480	3,495	3,106	8,081	36.30%
Treed Bog	62,692	33,154	7,069	4,291	44,514	71.00%
Upland Brush	53,008	2,896	2,643	708	6,247	11.80%
Water	47,751	6,355	4,506	4,056	14,917	31.20%
White Pine	93,568	17,888	3,674	15,340	36,902	39.40%
Total	3,936,085	346,446	320,835	376,435	1,043,716	26.50%

Appendix I – Area by Cover Type and Area Class LSSF (DNR 2006 OI)

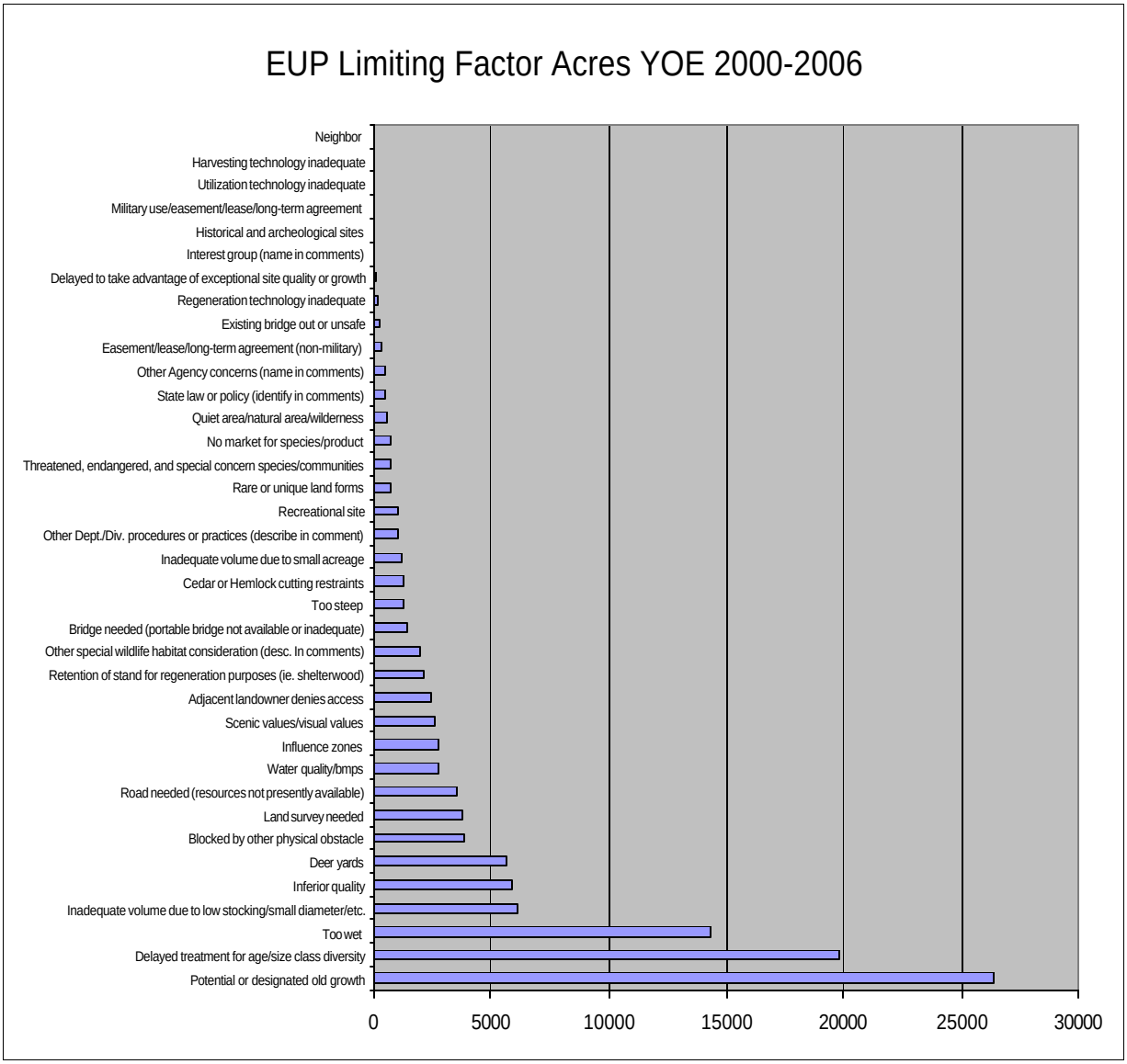
Cover Type	Commercial Forest	Non Timber Producing	Timber Prod Reserved	Non Timbered Land	Water	Total
Upland Hdwds	127478	488	1288			129254
Aspen	118293	2315	2180			122788
Jack Pine	104178	188	639			105005
Cedar	78600	19134	1749	27		99510
Red Pine	77249		527			77776
Mx Swmp Cnfr	58122	10015	1210			69347
White Pine	36582	25	295			36902
Black Spruce	33679	2809	365			36853
Lowlnd Poplr	21022	1328	76			22426
Swamp Hrdwds	16302	3321	931			20554
Paper Birch	16049	783	587			17419
Spruce Fir	14031	74	291			14396
Hemlock	6970	15	145			7130
Tamarack	5885	2028	168			8081
Oak	4252	507	101			4860
Total	718692	43030	10552	27	0	772301
Marsh	46	24341		45374		69761
Local Name	476		24	65		565
Water					14917	14917
Lowlnd Brush	1354	57903	245	17363		76865
Treed Bog		38814		5700		44514
Bog or Marsh	1	4487		7519		12007
Upland Brush	2511	2129	1458	149		6247
Grass	3534	1214	37070	177		41995
Non Stocked	103	401	763	2363		3630
Rock		86		49		135
Sand Dune	41	70		668		779
Total	8066	129445	39560	79427	14574	271415
Total	726758	172475	50112	79454	14917	1043716
Percent	70%	16%	5%	8%	1%	100%

Influence Zone	Acres	Percent
GENERAL FOREST INFLUENCE	706690	67.70%
DEERYARD INFLUENCE	119792	11.50%
WATER INFLUENCE	110301	10.60%
TRAVEL INFLUENCE	59748	5.70%
OTHER WILDLIFE HABITAT	15574	1.50%
RECREATION INFLUENCE	14982	1.40%
WILD OR NATURAL AREAS	11114	1.10%
LEASE OR LONG TERM AGREEMENT	5469	0.50%
UNDEDICATED	46	0.00%
	1043716	100%

Appendix K – Area by Forest Type and Stand Condition (DNR 2006 OI)

Cover Type	High Risk	Immature	In Process of Regen.	Low Quality	Mature	Non Stocked	SCA's	Sparse	Two Aged	Uneven Aged	Total
Aspen	1730	81584	4770	985	21045	1976	3333	2445	4068	852	122788
Black Spruce	124	22361	523	2333	6691	1108	2430	583	313	387	36853
Cedar	100	51722	111	9145	20943	746	12785	1760	972	1226	99510
Hemlock	30	1895			1170	3	1239		267	2526	7130
Jack Pine	847	60952	12425	752	20870	1633	3420	1187	2595	324	105005
Lowlnd Poplr	655	10948	973	1321	6101	80	590	1154	350	254	22426
Mx Swmp Cnfr	307	36850	442	4714	9392	382	9606	3311	1184	3159	69347
Oak		1525		22	298	490	552	282	458	1233	4860
Paper Birch	262	4698	637	401	7629	45	2491	231	609	416	17419
Red Pine	157	47488	1887	443	9242	571	4532	1638	5952	5866	77776
Spruce Fir	144	7677	206	418	2650	352	1124	400	554	871	14396
Swamp Hrdwds	176	5396	98	1916	1917	173	3773	647	169	6289	20554
Tamarack	322	2415	50	963	1569	55	1419	1168	45	75	8081
Hdwds	185	14319	293	2000	2051	507	4975	995	1352	102577	129254
White Pine	85	13449	177	298	4051	154	3580	676	4441	9991	36902
Total	5124	363279	22592	25711	115619	8275	55849	16477	23329	136046	772301
Percent	1%	47%	3%	3%	15%	1%	7%	2%	3%	18%	100%

Appendix L – Treatment Limiting Factors



Appendix M – Special Management Potential by Stand Cover (DNR 2006 OI)

Cover Type	None	Beaver	Devlp of Adja. Area	Endagered Species	Free Flow Stream	History	Other	Unusual Botanical	Unusual Geology	Unusual Scenic	Total	%
Aspen	118410	124	20	685	268	0	2033	1042	9	197	122788	4%
Black Spruce	36383			42	7		311	4		106	36853	1%
Bog or Marsh	11202	54					693	58			12007	7%
Cedar	90290	14		198	1913	15	6678	300	62	40	99510	9%
Grass	38800			596	83	290	660	449	7	1110	41995	8%
Hemlock	6564		13				468	85			7130	8%
Jack Pine	102559				6	7	2172	116		145	105005	2%
Local Name	508			23				8		26	565	10%
LowInd Brush	71978	768		40	1907		2091	81			76865	6%
LowInd Poplr	21686	17	6	15	187	8	485	22			22426	3%
Marsh	60378	412		128	51		7854	893	31	14	69761	13%
Mix Swamp Confer	67321	2		16	838		842	172	123	33	69347	3%
Non Stocked	3500				3		108	19			3630	4%
Oak	4537						289	26	8		4860	7%
Paper Birch	16386		9		52		600	54	38	280	17419	6%
Red Pine	70451		27	114	250	49	6840	4		41	77776	9%
Rock	135										135	0%
Sand Dune	602						148			29	779	23%
Spruce Fir	13294				57		958	73		14	14396	8%
Swamp Hrdwds	19604			16	271		333	330			20554	5%
Tamarack	7693						377			11	8081	5%
Treed Bog	43812	62			11		70	558		1	44514	2%
Upland Brush	6058				59		130				6247	3%
Upland Hdwds	116125		40	186	200	66	12074	268	204	91	129254	10%
Water	13873	374	8	188	66		358	30		20	14917	7%
White Pine	34639	54		2	115		812	135	185	960	36902	6%
Total	**976788**	**1881**	**123**	**2249**	**6344**	**435**	**47384**	**4727**	**667**	**3118**	**1043716**	
Percent	**94%**	**0%**	**0%**	**0%**	**1%**	**0%**	**5%**	**0%**	**0%**	**0%**		**100%**

Cover Type	Healthy	Conks	Dead/Flagged Branches	Deflo.	Deformed Trees	Other Animal Pests	Stunted/Dead Missing Trees	Stem Cankers	Un-Known	Weather Related	Total	% Healthy
Aspen	116130	1469	595	345	804	193	587	2515	26	124	122788	95%
Black Spruce	35500	13	471	181	187	63	383			55	36853	96%
Bog or Marsh	11955						52				12007	100%
Cedar	91954	159	1421	70	2679	360	954	259	1525	129	99510	92%
Grass	41950				12			33			41995	100%
Hemlock	6813		78	20			25	115		79	7130	96%
Jack Pine	100006	7	1886	454	365	125	1908	207		47	105005	95%
Local Name	565										565	100%
Lowlnd Brush	76425		51			217		16	156		76865	99%
Lowlnd Poplr	19848	115	706	186	308	13	270	912	56	12	22426	89%
Marsh	69688					2	58		13		69761	100%
Mx Swmp Cnfr	64271	8	1179	200	1177	183	1057	1034	125	113	69347	93%
Non Stocked	3612								18		3630	100%
Oak	4771		17	25	28	5			14		4860	98%
Paper Birch	15304	54	739	114	186	8	158	741	6	109	17419	88%
Red Pine	75749	41	307	141	496	379	567	17	28	51	77776	97%
Rock	127								8		135	94%
Sand Dune	664		115								779	85%
Spruce Fir	12556	251	543	235	231	44	343	142		51	14396	87%
Swamp Hrdwds	19072	29	175		154	138	323		603	60	20554	93%
Tamarack	6484	424	253				455	383	82		8081	80%
Treed Bog	44372		2	72	58					10	44514	100%
Upland Brush	6247										6247	100%
Upland Hdwds	121121	212	786	64	1767	1368	817	2442	620	57	129254	94%
Water	14876				41						14917	100%
White Pine	34303	15	628		1374		500	54	18	10	36902	93%
Total	994363	2797	9952	2107	9867	3098	8457	8870	3298	907	1043716	94.00%
Percent	95%	0%	1%	0%	1%	0%	1%	1%	0%	0%	100%	

Wildlife Species	Acres	Compartment Count
OTHER	170334	73
DEER	142008	71
DEER, RUFFED GROUSE, RABBITS	88498	41
DEER & RUFFED GROUSE	57413	28
SHARPTAIL GROUSE	37878	17
RUFFED GROUSE	20746	11
RABBITS	3910	2
Compartments With Record	520787	243
Total for EUP	1043716	495