4 - MANAGEMENT AREA DIRECTION

4.1 – Introduction

This section builds upon the discussions in the previous sections on forest history and current conditions and trends and provides specific management direction for each of the 33 state forest management areas in the eastern Upper Peninsula ecoregion (Figure 4.1). Management areas are groupings of forest compartments that range in size from approximately 1,400 to 148,000 acres. The boundaries of management units are based upon common attributes.

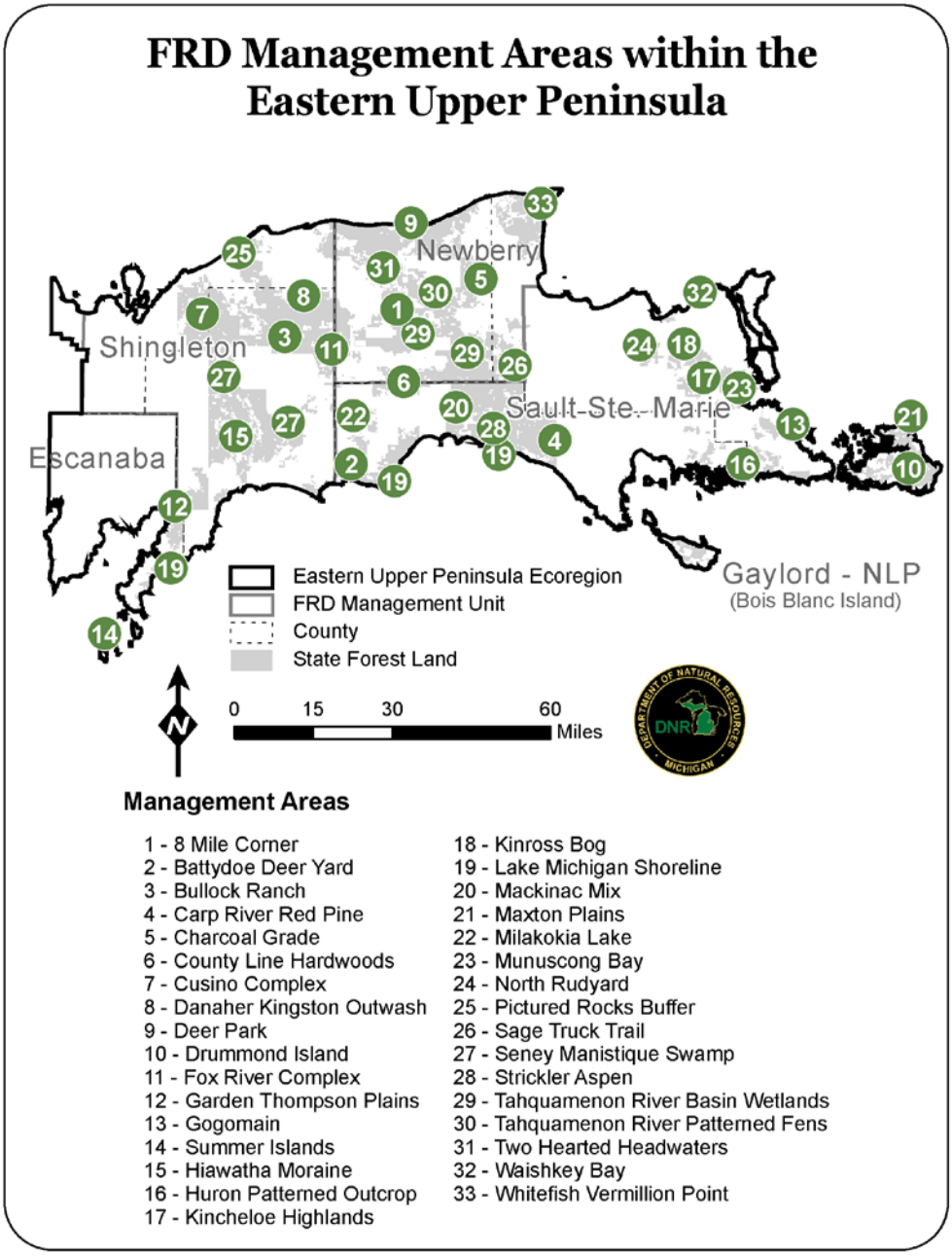

Figure 4.1. A map of the eastern Upper Peninsula ecoregion showing the management areas.

Each management area section contains:

- A summary of use and management;
- An introduction which includes a projection of harvest acres in this 10-year period planning period;
- Management direction for each of the major and some of the minor forest cover types in the management area, including a description of the current condition, desired future condition, 10-year vegetation management objectives and long-term management issues;
- Featured wildlife species and habitat specifications; and
- Discussions of rare fish, wildlife, plant management; forest health management; aquatic resources; fire management; recreation; access; and other regional-specific issues, such as oil and gas development.

Michigan state forest timber management is largely predicated upon a sophisticated and continually updated forest inventory that enables the use of a modified area control method and the associated balancing of age classes, rather than volume control. Area regulation is an indirect method of controlling the amount of timber to be annually harvested on the basis of an equal (balanced) number of acres in each of several age classes (up to a set rotation age) of stocked trees, in order to meet management objectives and as a means of ensuring sustained yields over time. Most public forestry agencies employ an area regulation approach to achieve sustainable, even flows of timber (Leak, 2011). For the Michigan state forest system, area control is used for management of even-aged stands in the aspen, jack pine and some oak forest types. Management of uneven-aged stands such as northern hardwoods is based upon a basal area/stocking approach and a combination of basal area and age class is used in management of red and white pine stands. Most lowland cover types are also managed as even-aged stands using the area control method. It is important to understand that balancing age classes for a forest type is a long-term management objective that can only be achieved over the course of time (typically 50-80 years). During this period, harvest levels in any given year-of-entry can be higher or lower than the desired long-term, area-regulated harvest level, as unbalanced age classes (resulting from past over- or under-harvesting) are rectified through additional harvest prescriptions. Application of the modified area control method to the effective base of timberland in the state forest ensures that harvest levels are sustainable and comply with forest certification standard requirements.

The calculation of projected harvest levels is a key component of each management area section in the regional state forest management plan and is framed in terms of projected harvests (in acres) for the major and minor cover types for the following decade. These projections are based upon several factors:

- The desired future condition for the forest type, which include area regulated (balanced) age-class distributions and the perpetuation or transition of dominant forest types based upon Kotar habitat classification (Burger and Kotar, 2003);
- The present acreage and age-class and/or stocking condition of forest types, based upon inventory data;
- Areas that are reserved from harvest due to treatment limiting factors or other management goals (including special conservation areas, high conservation value areas and ecological reference areas); and
- The type of silvicultural practices that are typically employed for different cover types, age classes and means of forest regeneration.

Other variable factors such as disease, insect, wind or fire mortality may also impact harvest levels. Where disease, insect or fire mortality problems are known in advance to apply to a management area (e.g., beech mortality due to beech bark disease) they are taken into consideration when establishing harvest levels for that management area. These factors cannot always be predicted with sufficient accuracy or certainty to allow them to be integrated into operational landscape level planning. So when they do occur, harvest schedules are often adjusted in the compartment review process to address them. Where there are occurrences of disease or insect outbreaks or large wind throws or wildfires, they are usually quite localized and may lead to unanticipated temporary increases in salvage harvests to avoid major losses in timber value. These unanticipated harvests are taken into account in subsequent annual planning analyses and processes.

All the above factors are integrated into Department of Natural Resources (DNR) planning processes at the strategic level (2008 Michigan State Forest Management Plan), operational landscape level (regional state forest management plans), and the tactical level (through the compartment review process). In particular, they are considered in formulating the management direction for each management area in the regional state forest management plan, which provide specific estimates of harvest levels for this 10-year compartment review cycle.

The management direction contained within each management area section of the plan is used with appropriate standards and guidelines and professional judgment in the compartment review process to plan tactical prescriptions for timber harvest. Whereas, standards originate from higher authority, they retain higher precedence than the contents of this plan. Standards and guidelines that are used for the operational management of the state forest include:

Standards:

1. Natural Resource Commission Policy 2204, Reforestation, issued January 1, 1977.
2. Natural Resource Commission Policy 2207, Management of State Forests, issued May 11, 1979.
3. DNR Policy and Procedure 32.22-06, Forest Type Mapping Instructions and Type Symbols, issued July 11, 2005.
4. DNR Policy and Procedure 32.22-07, Forest Management, issued July 11, 2005.
5. DNR Policy and Procedure 39.21-20, Beaver Management, issued July 11, 2005.
6. DNR Forest Management, Fire and Minerals Division Policy and Procedure 241, Reforestation, issued October 26, 1999.
7. DNR Forest Management, Fire and Minerals Division Policy and Procedure 251, Sale and Removals of Timber, issued March 1, 2000.
8. DNR Forest Management, Fire and Minerals Division Policy and Procedure 251a, Sale and Removals of Timber, Visual Management, issued February 28, 2002.
9. DNR Forest Management, Fire and Minerals Division Policy and Procedure 441, Operations Inventory and Compartment Review Procedures, issued January 19, 2000.
10. DNR Forest Certification Work Instruction 1.4 – Biodiversity Management on State Forest Lands.
11. DNR Forest Certification Work Instruction 1.5 – Social Impact Considerations and Public Involvement Processes.
12. DNR Forest Certification Work Instruction 1.6 – Forest Management Unit Analysis.
13. DNR Forest Certification Work Instruction 2.1 – Reforestation.
14. DNR Forest Certification Work Instruction 2.3 – Integrated Pest Management and Forest Health.
15. DNR Forest Certification Work Instruction 7.1 – Timber Sale Preparation and Administration Procedures.

Guidelines:

1. DNR Silvicultural Guidelines.
2. Within-Stand Retention Guidance (Michigan Department of Natural Resources, 2011).
3. Michigan Woody Biomass Harvesting Guidance (Michigan Department of Natural Resources, 2010).
4. Sustainable Soil and Water Quality Practices on Forest Land (Michigan Department of Natural Resources and Michigan Department of Environmental Quality, 2009).
5. Evaluating Riparian Management Zones on State Lands (Michigan Department of Natural Resources, 2004).
6. Forest Certification Green-Up Guidelines (Michigan Department of Natural Resources, 2006).
7. Guidelines for Red Pine Management (Michigan Department of Natural Resources, 2006).
8. American Beech Management: Beech Bark Disease (Michigan Department of Natural Resources, 2012).
9. Ash Management: Emerald Ash Borer (Michigan Department of Natural Resources, 2012).
10. Rare Species Protection Approach and Assessment Guidelines (Michigan Department of Natural Resources, 2008).
11. Interim Management Guidance for Red-Shouldered Hawks and Northern Goshawk on State Forest Lands (Michigan Department of Natural Resources, 2012).
12. Strategy for Kirtland's Warbler Habitat Management (Michigan Department of Natural Resources et al., 2001).
13. The average size of clearcut harvests over the state forest system should not exceed 120 acres, except where necessary to meet regulatory requirements or to respond to forest health emergencies or other natural catastrophes (The Sustainable Forestry Initiative, Inc., 2010).
14. Deer Winter Range Guidelines (Michigan Department of Natural Resources et al., 2013)

This forest plan is based upon 2012 DNR state forest inventory data. A model was used to analyze the inventory data and to generate the tables and figures presented in this plan section. Metadata describing the design elements and functions of this model is provided in Appendix D.

The state forest inventory in the eastern Upper Peninsula ecoregion totals 1,068,956 acres, of which 807,145 acres (76%) are forested (Table 3.1). The dominant cover types are northern hardwood (12%), aspen (11%), cedar (11%), jack pine (9%), red pine (7%) and lowland conifer (7%) (Table 3.1). Non-forest conditions are dominated by lowland open/semi-open lands which make up 19% of the state forest land. There are 91,300 acres (9%) of forested land with hard limiting factors, resulting in 715,845 acres (91%) of manageable forested land.

Some broad trends on forest acreages merit a brief discussion here and are discussed in further detail in the management area sections that follow. The total forested area is expected to remain unchanged and individual cover type acreage is also expected to remain similar to the current acres. Beech bark disease will result in heavy mortality of beech trees and emerald ash borer damaged areas are expected to expand. Therefore, stands containing high percentages of beech, ash or both are not likely to be available for harvest for many years after salvage harvests are completed.

Management of lowland cover types (mixed lowland conifers, lowland deciduous, lowland spruce/fir, tamarack and cedar) are expected to increase over this planning period. This is due to a number of factors, including an abundance of mature and over-mature acres in these lowland forest types; emerging forest health issues associated with some mature forest types; and a current DNR project to digitize, review and update old hard copy maps of deer wintering complexes (comprised predominantly lowland conifer cover types) into a unified GIS shape file.

The modeled DNR inventory data projects a prescribed harvest level of 135,470 acres over this 10-year planning period for the state forest in the eastern Upper Peninsula ecoregion, which is the summation of the projected 10-year final harvest area and the projected 10-year partial harvest area levels for both major and minor cover types in each management area (Table 4.1). These projections should be considered to be prescribed inventory acres. Proposed timber sale acres are consistently 10% less than prescribed inventory acres, due to site-specific conditions (such as access issues or survey needs). Considering this, the acreage of proposed timber sales the state forest in the eastern Upper Peninsula ecoregion is projected to be about 122,000 acres over this 10-year period (an average of about 12,200 acres per year). This does not mean that 12,200 acres of timber will be harvested during every year in this 10-year planning period. Harvest levels in any given year may actually be lower or higher than 12,200 acres due to several reasons, including variability in the proportion of different forest types and their age/size classes in any given year-of-entry, variability in the timing of actual harvests during the 3-4 year timber sale preparation and contract process and variability in the number of unanticipated salvage harvests (due to forest health or fire occurrences). Likewise and for the same reasons, there is variability in the annual harvest levels in any given forest management unit. Harvest levels in each cover type will also be variable due to reclassification of cover types as the transition from the Operations Inventory to Integrated Forest Monitoring Assessment and Prescription forest inventory systems progresses during the planning period. Harvest levels in lowland cover types may be higher or lower, as available acres are quantified by collection of site condition (limited factor) data for all forest stands during the planning period. However, over the full 10-year planning period it is anticipated that about 122,000 acres of timber will be harvested from the eastern Upper Peninsula ecoregion.

Table 4.1. Projected harvest level by cover type aggregated over all management areas over the next decade for the state forest in the eastern Upper Peninsula ecoregion (unpublished Department of Natural Resources inventory data).

Species	Percentage of State Forest Land	Current Acreage	Hard Factor Limited Acres	Manageable Acres	Projected 10-Year Final Harvest	Projected 10-Year Partial Harvest	Projected Acreage in 10 Years
Lowland Open/Semi-Open Lands	19%	197,964	0	197,964	0	0	197,964
Northern Hardwood	12%	123,444	5,279	118,165	0	49,640	123,444
Aspen	11%	117,222	9,481	107,741	4,666	0	117,222
Cedar	11%	112,721	4,075	108,646	1,896	0	112,721
Jack Pine	9%	99,341	5,933	93,408	4,464	0	99,341
Red Pine	7%	76,278	6,582	69,696	4,827	20,446	76,278
Lowland Conifers	7%	71,264	20,364	50,900	7,511	0	71,264
Upland Open/Semi-Open Lands	4%	43,040	0	43,040	0	0	43,040
Lowland Spruce/Fir	3%	37,079	9,003	28,076	3,579	0	37,079
White Pine	3%	30,569	3,006	27,563	4,029	7,390	30,569
Lowland Deciduous	3%	28,640	5,927	22,713	2,443	0	28,640
Misc Other (Water, Local, Urban)	2%	20,807	5	20,802	0	0	20,807
Lowland Aspen/Balsam Poplar	2%	16,269	3,932	12,337	1,322	0	16,269
Upland Spruce/Fir	1%	13,861	2,791	11,070	1,631	0	13,861
Upland Conifers	1%	11,043	195	10,848	2,475	3,099	11,043
Upland Mixed Forest	1%	10,843	292	10,551	1,498	2,694	10,843
Paper Birch	1%	10,425	5,883	4,542	437	0	10,425
Tamarack	1%	9,580	5,375	4,205	730	0	9,580
Natural Mixed Pines	1%	9,523	553	8,970	929	2,715	9,523
Lowland Mixed Forest	1%	9,001	625	8,376	1,387	0	9,001
Mixed Upland Deciduous	1%	8,952	191	8,761	1,680	2,282	8,952
Hemlock	1%	6,936	1,292	5,644	0	425	6,936
Oak	0%	3,690	518	3,172	283	793	3,690
Planted Mixed Pines	0%	464	0	464	87	114	464
Totals	**100%**	**1,068,956**	**91,300**	**977,656**	**45,873**	**89,597**	**1,068,956**

Climate Change Considerations

As the climate continues to change, the effects of these changes may present forest managers with challenges to achieving the desired future conditions outlined in this plan and exploration of additional strategies for adapting to these changes may be warranted. Within the scope of this plan, forest managers may consider management actions that help to put forests in a better position to respond to a range of future conditions. Millar et al. (2007) described an adaptation framework with actions that fit into three broad categories:

- Resistance Actions – These help a forest ecosystem build its defenses, both against the direct impacts of a changing climate and the indirect impacts of other threats that are aggravated by climatic changes. These are for situations where there is a goal of keeping the ecosystem in a relatively unchanged condition. Examples of actions include creating a complete fire-break around a unique, vulnerable area or intensive removal of all invasive species from an area. For many areas, these actions may only make sense in the short-term, as ultimately, the climatic changes may simply go beyond the physical limits of the species or system and will likely get more expensive with greater climate changes.
- Resilience Actions – These help a forest ecosystem rebound and return to a prior condition following a disturbance and are for situations where a small-degree of change is acceptable. Resilience actions are similar to resistance actions, but are applied more broadly and focus on helping a system cope with disturbance. An example would be actions that help to increase the diversity of species in an ecosystem. Again, these actions may not be long-term solutions, if the climate becomes completely unsuitable for that ecosystem.
- Response Actions – These help a forest ecosystem change and move to a different condition that is suitable for a changing and new climate. These actions include assisted migration (intentionally moving a species to a location outside of its current range) and promoting connected landscapes.

Decisions about what types of adaptation actions are most appropriate for an area will need to consider the implications of climate changes to that area and recognize that they will be influenced by differences in ecosystem, ownership and management objectives. Section 3 includes an overview of some regional differences that may affect which kinds of actions are most appropriate.

Many of the special resource areas described by management area in this section have characteristics that may make them more vulnerable to climate change, as well as characteristics that may make them good candidates as refugia for species threatened by climate changes. Refugia are “locations and habitats that support populations of organisms that are limited to small fragments of their previous range” (Handler et al., In Press). In addition to their potential for providing

some protection for vulnerable species and ecosystems, refugia may also be valuable for their potential to protect water supplies and functions as they fluctuate across the landscape (Handler et al., In Press).

Some special resource areas are examples of natural communities that are already rare – either have very specific hydrologic/climatic/disturbance requirements or are already threatened in other ways; regardless, this will make them more vulnerable to additional threats/stresses. However, those special resource areas that are already in good condition and include diverse species and few invasives will have a higher adaptive capacity than other lower quality places, making them good potential refugia. High-quality natural communities are more likely to support rare species – this is an additional characteristic that will make some special resource areas valuable as refugia. Additionally, management objectives already in place in many special resource areas focus on promoting high-quality natural communities, thus are already in line with the best adaptation strategies.

Special Resource Area Management Direction

The Department of Natural Resources has used many mechanisms to identify areas that may have particular or special biological/ecological, social or economic conservation objectives or values. For example, some state natural areas have been dedicated by Natural Resource Commission resolutions and the Simmons Woods Area was established using a land use order under the authority of the director. Some areas are managed through memorandums of understanding and statute, and there are also areas that have been noted for their biodiversity potential through less formal mechanisms.

Over time it has become challenging to sift through naming conventions and designations to understand the broad range of conservation values within the state forest system. The special resource area management direction section of this plan begins the process of collating and organizing these areas and their associated designations.

This section provides a description of areas of the state forest that have been identified as having specific or special resource attributes that are considered in management planning and activities. The majority of these areas are noted for renewable resource conservation values; however, some social and non-renewable categories (e.g., concentrated recreation areas and mineral resource areas) have also been included in order to document and track their purposes.

Areas with specific conservation values have been sorted into three primary categories: special conservation areas, high conservation value areas and ecological reference areas. Each category has a conservation value trait and a 'level of recognition' trait. Combined, the two traits determine whether an area is identified as a special conservation area, a high conservation value area or an ecological reference area. It is anticipated that over time, areas will be moved between, added and/or removed from these categories based on conservation values and level of recognition.

Special Conservation Areas: Special conservation areas are areas of state forest land that have one or more identified special conservation objectives, interests or natural community (Kost et al., 2007) element occurrences. They are a broad assemblage of areas that possess some inherent ecological, social or economic value. Conservation objectives listed in the special conservation area category have been identified through a variety of methods and mechanisms. The type and strength of recognition (and possible management options) will vary depending on the process used to identify the conservation value. For example, some objectives are detailed in the land use orders of the director (force of law) while other may be identified through cooperative agreements (administrative recognition). Areas formerly identified through administrative recognition that have not had that recognition superseded by another formal designation will have administrative recognition re-affirmed by this plan. There are also objectives developed through department process or agreement (e.g., deer wintering areas, potential old growth or riparian buffers). The special conservation area category may also be used to document areas identified by an external group or organization, such as National Audubon Society's Important Bird Areas Program.

High Conservation Value Areas: High conservation value areas are areas of state forest lands that have been recognized for their contribution to specific conservation objectives or ecological attributes through a public process. Examples of these formal processes include: legislation, administrative rule or director's or Natural Resource Commission orders. High conservation value areas include dedicated natural, wilderness and wild areas; natural rivers; species recovery plan areas such as piping plover habitat areas; and critical dune areas.

Designated high conservation value areas are located only upon state forest land, but within a landscape context, conservation efforts of equivalent high conservation value area resources should be coordinated with other private and agency landowners. The high conservation value area category is intended to address the Forest Stewardship Council, U.S. Forest Management Standard (v1.0) Principle 9, which requires the maintenance of high conservation value forests.

Ecological Reference Areas: Ecological reference areas are areas that serve as models of ecological reference within the state. They are high-quality examples of ecosystems that are primarily influenced by natural ecological processes and

they can be located upon any land ownership. High-quality natural communities recognized by NatureServe (an internet based international network of biological inventories) and the Michigan Natural Features Inventory as global (G) or state (S) endangered (1), threatened (2) or rare (3) and with an element of occurrence (EO) rank of A or B in the Michigan Natural Features Inventory database serve as an initial set of ecological reference areas. This ecological classification system was selected as a baseline because it is nationally and internationally acknowledged and is based on a sound scientific system. The ecological reference area category is intended to address the Forest Stewardship Council, U.S. Forest Management Standard (v1.0) Criterion 6.4, which requires the establishment of a system of protected representative ecosystems across the landscape of all ownerships.

Identified ecological reference areas, high conservation value areas and special conservation areas will be managed to conserve, protect and/or enhance the defined conservation objective or value. The methods used will vary depending upon the objective and type of designation. Methods can include active management or just the provision of access. Either method must be compatible with the defined conservation objective or value. Land managers, field staff and stand examiners use technical materials, program staff and/or other references when assessing management options that are suitable for the specific conservation objective. All areas will be managed to protect the immediate natural resource values with consideration of human health and safety.

Areas that are designated as ecological reference areas, high conservation value areas and special conservation areas may overlap one another and are not mutually exclusive. The Department of Natural Resources has developed maps that show the spatial extent of these areas across the landscape of the eastern Upper Peninsula ecoregion.

The starting point for reviewing special conservation areas is the operations inventory and compartment review process. The starting point for reviewing high conservation value areas and ecological reference areas is the Biodiversity Conservation Planning Process. Both processes include public participation and consider nominations for inclusion, removal or other changes to designations. Additional information regarding these areas can be found in the Conservation Area Management Guidelines and the standards and guidelines applicable to the management directions for each type of special resource area can be found in Section 5 of the Michigan State Forest Management Plan, 2008.

Cultural and Customary Use Areas

Cultural and customary use areas include areas that possess and provide significant values and purposes for Native American tribes and other various ethnic or religious groups; or, sites that have been traditionally used by tribes and the public for specific purposes. Cultural use areas include those that possess spiritual and cultural values and traditional gathering of non-timber forest products by Native American tribes and other people. Customary use areas are those that are used seasonally and may include such uses as maple syrup, wild fruit and other plant gathering areas and placement of traditional hunting camps.

The eastern Upper Peninsula offers an abundance of areas that produce gathering opportunities for specific ceremonial, medicinal, craft and edible items under appropriate permits where applicable. There are at least 138 products documented in over 54 botanical families and 87 genera, including more than 100 separate species in the eastern Upper Peninsula.

The maintenance and preservation of cultural and customary use areas for future generations is important to our society. Use of these areas to conduct natural resource gathering and harvesting activities are important for economic reasons, recreation and social ties and for the values of self-sufficiency, independence, work ethic and relationship with nature.

Land use permits for non-tribal customary and cultural uses are coordinated by each forest management unit. Permits for cultural and customary uses of state forest resources by tribal members who are exercising their gathering rights in areas that are under the 2007 Inland Consent Decree for the 1836 Treaty of Washington (Figure 4.2) are issued by their respective tribal government.

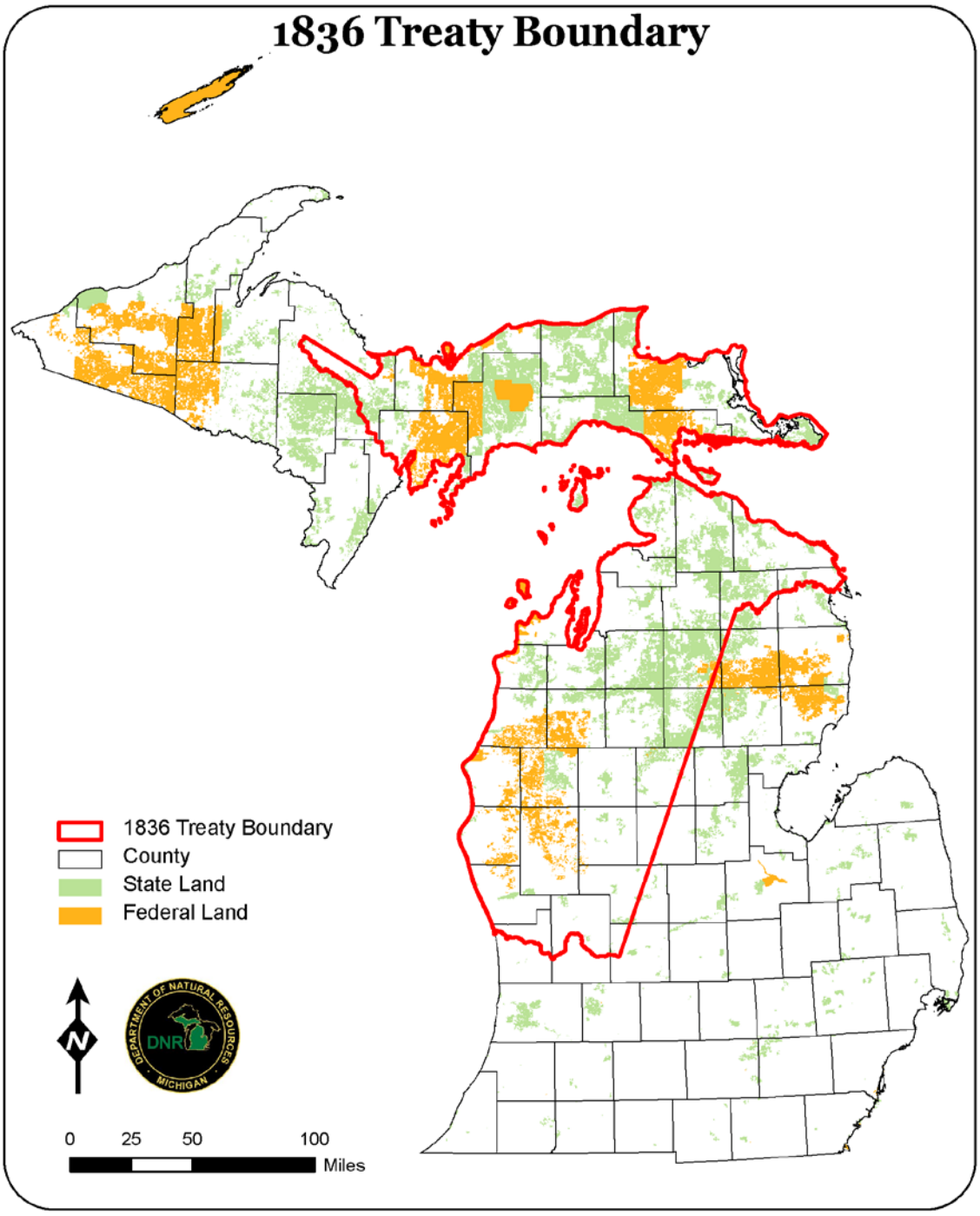

Figure 4.2. Boundary for the 1836 Treaty of Washington (Department of Natural Resources, 2007).

Archaeological Sites

Archaeological sites have intrinsic social value and require protection in the eastern Upper Peninsula ecoregion. There are two types of archaeological sites. First, three are the pre-historic sites that existed before the arrival of Europeans. Examples of pre-historic sites are camp sites, village sites, quarries, mortuary mounds and other areas used by early natives. The second type of archeological site is the historic site. These are sites that may be part of the written record, including cemeteries, town sites, logging camps and homesteads. In the ecoregion, most historic sites are from the early 1800s to the mid-20th century.

Sites may be identified by natural heritage data from the State Historical Preservation Office and Office of the State Archaeologist. Sites or possible sites may be discovered in the course of normal field work. These sites should be reported to the Office of the State Archaeologist if they are not already in the database. To protect archaeological sites it is necessary to safeguard location information. This information is sensitive and will be protected from public disclosure and as such, is exempted from the Freedom of Information Act.

Tribal governments should be contacted when working in areas where Native American use may have occurred. Tribal governments should receive notification of open house meetings to enable review of treatment proposals for any possible disruption to archeological sites.