

Assessment of High Conservation Value Areas on the Menominee Indian Reservation

In accordance with principles of the Forest Stewardship Council (FSC), to the FSC standards and policies, and the Menominee Tribal Enterprises Forest Management Plan (2012-2027)



An oblique aerial photograph in the southwest corner of the Menominee Indian Reservation demonstrates several high conservation value areas: contiguous type 2 old growth northern hardwood forest, pristine trout stream (Red River), and undeveloped lakes (Hemlock and Burney).

Scope of assessment

Menominee Tribal Enterprises (MTE) has initiated the assessment of high conservation value areas (HCVs) on the 235,000 acre Menominee Indian Reservation in northeast Wisconsin USA. This assessment, following the six recognized HCV¹ categories, was implemented to address major corrective action request 2104.4 and retain FSC certification.

The Reservation is unique because it has survived as an island of native forest in an ocean of cleared land. It is a vestige of the prehistoric Lake States landscape that existed prior to clearing for farming by settlers, timber barons, and residential development over the last century. The Tribe recognized that their future depended on the forest and embarked on a path of sustained yield management that avoided forest exploitation and preserved the Tribe's existence. Sustainability has been the driving force for forest management for the past century. As proof of this success, there is more standing saw timber volume (1.9 billion board feet) now, than there was in 1854 (estimated at 1.2 billion board feet). During this same period, over 2.25 billion board feet have been harvested from the same acreage. In essence, the entire volume of the forest has been harvested twice, and there is more forest volume standing today than when timber harvesting began. The backbone to the Tribal economy has been its forest product industry. The Tribal Enterprise traces its origins back to 1908 when a sawmill was built in Neopit, WI. Since the sawmill is not federally subsidized, the success of operation depends on the steady flow of timber from forest to market. The Enterprise employs approximately 125 that are mostly tribal members, plus 180 loggers.

Menominee ancestral lands were maintained wisely for critical environmental and cultural values by the Menominee for millennia. HCV's have been identified and protected by MTE for the last century on the Reservation, for example, with the incorporation of goals for non-timber resources into management prescriptions, including cultural resources, biodiversity, wildlife habitat, water quality, and aesthetics. However, the Menominee have used different terminology and documents than those described by the recently developed FSC standards. This document serves as the initial step in organizing MTE's HCV management to comply with the standardized FSC format. The assessment results and management strategies are summarized in **Table 1** and subsequently broken down into six chapters. The report will be made publically available on the MTE website so that key stakeholders can have access to the information for raising questions and concerns in the future.

There are three components to MTE's plan to organize and further identify HCV areas:

1. **Identification:** A workgroup within MTE's forestry department began by identifying areas that meet the definitions of the six HCV types on the Menominee Reservation. This workgroup, led by the Forest Manager (Marshall Pecore), is comprised of staff trained in forestry and ecology from the Silviculture (Anthony Waupochick M.S.), Inventory (Paul Crocker M.S.), and Forest Health (David Mausel Ph.D.) departments. For over a century, MTE has maintained an "open door" policy of technical exchange with local, federal, state, university, and industrial forestry professionals, resulting in implementation of "cutting edge" forestry practices and ecosystem management. In sustaining those traditions, stakeholder consultation with external and local

¹Brown, E., N. Dudley, A. Lindhe, D.R. Muhtaman, C. Stewart, and T. Synnott (eds.). 2013. Common guidance for the identification of High Conservation Values. HCV Resource Network. Accessed 9 Jan 2015 <https://ic.fsc.org/hcv-common-guidance.589.htm>

experts will continue and potentially identify previously unknown HCV. As such, this document is subject to revision as new information is obtained through continued technical exchange.

“Native Americans continually demonstrate environmental sensitivity towards the earth's precious resources and are looked to by many to 'show the way' to replenish the earth's resources. In today's changing world, however, the tribe is faced with a complexity of situations demanding a marriage of traditional management practices with the cutting-edge of biological management.” -Donny Reiter (MITW Wildlife biologist)

2. **Management:** An existing or new management strategy was established by the workgroup in order to maintain or enhance each HCV, using the precautionary principle when the scientific information is incomplete. The management strategies will be added to silvicultural prescriptions.
3. **Monitoring:** A monitoring regime was established by the workgroup to ensure that each HCV is being maintained or enhanced.

Table 1. Summary of the six high conservation values (HCV), examples of each on the Menominee Indian Reservation, and list of consultants to the Menominee Forest that have knowledge of these HCV areas.

Six recognized HCV types as specified in the FSC-US Standard	Areas of HCV on the Menominee forest	Summary of consultations with Tribal members, Tribal Government, qualified specialists, and independent experts
HCV1 HCV forest areas containing globally, regionally, or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)	Karner blue butterfly area of high potential range, wild ginseng	Kathy Carnes , US Fish and Wildlife Service Diane Brusoe , Wisconsin DNR Douglas Cox , MITW Env. Services Department Donny Reiter , MITW Conservation Department
HCV2 HCV forest areas containing globally, regionally, or nationally significant large landscape level forest contained within, or containing the management unit where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.	Contiguous areas of forest dominated by tree species endemic to the region including northern hardwoods ² , white pine and hemlock. It is comprised of mixed age stands that include trees greater than 160 years old.	Tom Tidwell , Chief of the US-Forest Service John Kotar , Univ. of Wisconsin - Madison Dr. Hans Schabel , Univ. of Wisconsin-Stevens Point Maria Janowiak , US Forest Service Matt Anderson , BIA
HCV3 HCV forest areas that are in or contain rare, threatened or endangered ecosystems.	Rushes Lake, Wolf River, mesic cedar forest (S1) ³ , forested seep (S2), pine barrens(S2), oak barrens(S2), bedrock glade (S3), tamarack swamp (S3), northern hardwood swamp (S3), northern dry mesic forest (S3), northern dry forest (S3)	National Wild and Scenic River System Benjamin Sands , Penn State University Marc Abrams , Penn State University Jeremy Pyatskowitz , MITW Doug Cox , MITW Donny Reiter , MITW Wisconsin Wetlands Association Jeremy Pyatskowitz , MITW Environmental Services Department National Wild and Scenic River System , US Government Anthony Waupoichick Jr. , Univ. of Central Washington
HCV4 HCV forest areas that provide basic services of nature in critical situations	Wetlands in the Wolf River watershed immediately upstream from the Menominee county/Shawano county boundary, riparian wetlands within the Reservation	Tribal members MITW Government Joseph Preloznik , Attorney Brian Hosmer , Univ. of Tulsa
HCV5 HCV forest areas fundamental to meeting basic needs of local communities.	Areas on the Menominee forest where sustainable forest management provides economic ability of the local community to maintain their cultural identity.	David Grignon , Menominee Historic Preservation Officer Dr. David Overstreet , College of Menominee Nation Tim Guyah , BIA MITW Government

² The most common northern hardwood long-lived tree species include: sugar maple, American beech, red maple, American basswood, white ash, northern red oak, quaking aspen, yellow birch and eastern hemlock (Wisconsin Department of Natural Resources. 2012).

³ Imperiled and rare natural communities according to Wisconsin Department of Natural Resources-Natural Heritage Inventory <http://dnr.wi.gov/topic/endangeredresources/communities.asp> (State element ranks; S1 = Critically imperiled; S2 = Imperiled; S3 = Rare)

HCV 1

HCV forest areas containing globally, regionally, or nationally significant concentrations of biodiversity values.

HCV areas on the Menominee forest: Karner blue butterfly area of high potential range, wild ginseng

Assessment methods:

An assessment of this standard required consultations with experts including staff from the US Fish and Wildlife Service (Kathy Carnes, Karner Blue Butterfly Recovery Team Coordinator), Wisconsin DNR (Diane Brusoe, Karner Blue Partnership Coordinator), Menominee Indian Tribe of Wisconsin Environmental Services Department (Donny Reiter, Douglas Cox), MTE forest inventory (Paul Crocker) and forest health (Dr. David Mausel) departments. Relative documents pertaining to the assessment included the Wisconsin DNR Karner Blue Butterfly Habitat Conservation Plan Users Guide⁴ and the Menominee Tribal Enterprises Forest Management Plan.

Assessment explanation:

“The Menominee Forest has a number of species present within the forest that are not present or are in trouble in the State of Wisconsin. This can be attributed to the successful forest management for over 100 years. –Donnie Reiter (MITW Wildlife Biologist)⁵ .

On the Menominee, wild lupine (*Lupinus perennis*) is the sole larval host plant of the federally endangered Karner blue butterfly (KBB, *Lycaeides melissa samuelis*). The southeastern area of the Reservation is considered an area of high potential range for the butterfly (Appendix A). As such, the butterfly is designated as a HCV 1 and the patches of wild lupine are identified as essential for the populations of the butterfly.

Wild ginseng (*Panax quinquefolius*) is listed in the Convention on International Trade in Endangered Species (CITES). The plant is designated as a HCV 1 due to its sensitivity to environmental changes, the potential for over harvesting and the CITES listing. The Menominee Indian Tribe of Wisconsin (MITW) Conservation Department regulates the harvest, sale and purchase of wild ginseng.

Assessment results:

Field surveys since 2011 indicate that wild lupine populations are present in the southeastern area of the Reservation, primarily along roads and other open areas (Appendix B). Because the plant is shade intolerant, forestry thinning, shelterwoods, pine releases, clearcuts and other management activities (e.g., fire management in barrens, wildlife openings, and restoration activities) are considered beneficial to KBB, but must proceed with caution to not harm existing lupine populations.

For wild ginseng, there is currently no system to monitor or map populations of the plant. There is potential to begin monitoring population dynamics during the next Continuous Forest Inventory measurement (CFI) that is currently in the planning stages.

⁴ <http://dnr.wi.gov/topic/ForestPlanning/karner/hcpGuide.html>

⁵ <http://dnr.wi.gov/topic/EndangeredResources/ETList.html>

Management strategies:

Protection of wild lupine and KBB follows best management practices described in the Karner Blue Butterfly Habitat Conservation Plan Users Guide. See (Appendix C) below for a recent example of the application of the user's guide. In addition, herbicide use is banned in areas where wild lupine exists.

It has been observed that ginseng populations survive selective logging and other even-aged harvests and logging may even have beneficial effects after an initial shock due to changing environmental conditions. The primary risk to ginseng is over harvesting by Tribal members, and MITW is working to keep accurate harvest records and educate harvesters in the legal harvest and stewardship of the plant.

Monitoring strategies:

Monitoring consists of wild lupine road surveys and butterfly surveys⁶ before logging or other activities take place so that the plant can be avoided and protected. Wild ginseng monitoring may be included during the next CFI measurement.

⁶ <http://dnr.wi.gov/topic/ForestPlanning/karner/emergence.html>

HCV 2

HCV forest areas containing globally, regionally, or nationally significant large landscape level forest contained within, or containing the management unit where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.

HCV areas on the Menominee forest: Contiguous areas of forest dominated by tree species endemic to the region including northern hardwoods⁸, white pine and hemlock. It is comprised of mixed age stands that include trees greater than 160 years old.

Assessment methods:

The review of this HCV type required consultation with MTE forestry staff including the MTE Forest Manager (Marshall Pecore), the silviculture (Anthony Waupochick), forest health (Dr. David Mausel) and inventory (Paul Crocker) departments. External consultants and visitors to the Menominee related to this HCV have been too numerous to list but include such notables as Tom Tidwell (Chief of the USFS), Dr. Jerry Franklin (Univ. of Washington), Dr. Ken Raffa (Univ. of Wisconsin-Madison), Dr. John Kotar (Univ. of Wisconsin-Madison), Dr. Lee Frelich (Univ. of Minnesota), and Dr. Hans Schabel (Univ. of Wisconsin-Stevens Point). The MTE forest inventory department provided much of the information for this assessment with results summarized from forest inventory data. Relative documents pertaining to the assessment included information derived from the Ecological Landscapes of Wisconsin Handbook, Finley's pre-settlement vegetation maps, and the Menominee Tribal Enterprises Forest Management Plan 2012-2027.

Assessment explanation:

The 160-year history of forest resource management on the Menominee forest stands as a practical example of sustained yield forest management (Menominee Tribal Enterprises, 2012). For the Menominee, timber quality and quantity is of paramount importance along with maximizing forest composition diversity. The present size of the Menominee forest is more than 235,000 acres of which approximately 95% is forested (Menominee Tribal Enterprises, 2005). The remaining acres are water (lakes, rivers, streams) or have been converted for residential or other non-forestry community uses. The Reservation has three developed areas around Tribal villages, residential development in the southeast corner around several recreational lakes, widely scattered residential parcels and several agricultural fields. Overall, the forest remains a contiguous tract of land that provides a wealth of biodiversity that was prominent in the Lake States area historically, but lacking in the region today. Compelling evidence of the uniqueness of the Menominee forest is evident as seen from overhead satellite imagery (**Figure 1**). The forested boundaries of the Menominee Reservation are easily recognized from the surrounding farmland that occupies a majority of the southern half of Wisconsin. The light colored northeast streak across the photo was the path of the June 2007 tornado. Timber in this area was salvaged and the stand is in the process of regenerating back to forest.

⁸ The most common northern hardwood long-lived tree species include: sugar maple, American beech, red maple, American basswood, white ash, northern red oak, quaking aspen, yellow birch and eastern hemlock (Wisconsin Department of Natural Resources. 2012).



Fig. 1. Satellite image of the Menominee Reservation shows the contiguous block of native forest surrounded by lands converted to agriculture and residential development to the east, west, and south. To the north is the Nicolet National Forest that was established on cut-over lands at the turn-of-the century.

According to the Ecological Landscapes of Wisconsin Handbook, Wisconsin is divided into 16 ecoregions, with similar ecology and management opportunities (Appendix D). The Menominee Reservation falls into two broad ecological landscapes: the **Forest Transition** and the **Northeast Sands** landscape. These landscapes have distinguishing soil and vegetation attributes and different combinations of natural communities. The forest transition landscape was historically extensively vegetated by hemlock-hardwood forests but is now dominated by agricultural uses. The northeast sands landscape was also forested but has sandier soils, and forests were primarily oak, aspen and pine with some hemlock and beech. Within these landscapes, Menominee has type 1 and 2 old growth stands and several imperiled natural communities that have been maintained as a result of wise management.

The Menominee forest remains a remnant of mature and diverse pre-historic native forest that supports a wealth of species and natural communities unique to the Lake States (Menominee Tribal Enterprises, 2012). The forest can be visualized with MTE forest inventory data showing the distribution of major forest cover types (Appendix E). These generalized cover types contain a bewildering variety of stand structures and composition. Some of the older trees on the forest are over two centuries old. A combination of Continuous Forest Inventory (CFI) data and stand exam information is used to track and manage the various age structures and species mixes within these cover types.

Mixed hardwood stands exist in various stages of even-aged management as well as areas of all-aged structure representing many old growth characteristics. As shown in (Appendix E), The Menominee Indian Reservation is 95% forested with most areas being hardwood mixtures. A harvest schedule applies selective thinning to these sites roughly every fifteen years. Thinning these stands maintains all ages and size classes of trees and maintain a density that optimizes growing conditions. Large dominant

sugar maple, oak and beech trees remain prominent in the canopy along with the other associated hardwood and conifer species. It is common to have trees in these stands that are well over 160 years in age.

The majestic white pine forests within the Reservation are unlike most other stands left in the Lake States with specific ecological niches only present within this late seral stage (Frelich, 2002). The white pine cover type and associated species was a more common component of northern and central Wisconsin forested landscapes in the pre-European settlement era than at present. Between 1830 and 1930, most of the land surrounding Menominee was cleared for agriculture and for the timber value (Appendix E). Fires also occurred as a result of land clearing and most of the landscape was negatively affected (Figure 2).



Fig. 2. Severely cut-over and burned land in Vilas Co. Wisconsin (1911)

These historically cut-over areas were affected by fires that significantly reduced the white pine seed source. In spite of this, stands of old growth white pine over 100 years in age and some exceeding 160 years in age remain a significant part of the Menominee forest today (Appendix D). The white pine cover type is significant at about 34,000 acres (Menominee Tribal Enterprises. 2012). Of this, 15,000 acres is between 130 and 180 years of age.

Similar to white pine, hemlock was harvested heavily and was at its lowest levels in history during the depression years (Lancaster, 1985). Hemlock currently remains in low levels within Wisconsin and Michigan because many landowners prefer management for more economically advantageous species. Hemlock is abundant on the Menominee and covers 20,000 acres of hemlock-dominated stands. It is found in nearly pure stands and as a component of stands on many ecological habitat types. It is often associated with areas containing sugar maple, beech, yellow birch as well as many other hardwood and

swamp conifer species. Hemlock commonly grows beyond 160 years in age and has been recorded to be 250 to 300 years old at maturity with some trees living much longer (Lancaster, 1985). Hemlock has always been a large part of the Menominee forest and will remain in areas actively managed for timber and also in areas in and along wetlands that will never be logged due to access issues.

Assessment results:

A majority of the Menominee Reservation is considered an example of HCV2. The Menominee Indian Reservation is a unique and large landscape-level contiguous forest that has remained analogous to pre-settlement forest cover types. Single ownership of the tribal forest remains with the Tribal members with trust oversight by the Bureau of Indian Affairs. Historically, the Menominee Tribe has not treated the forest as a wilderness preserve but as a “near natural” working forest. The Tribe is dependent on the economic benefits that harvesting provides. Timber harvesting has traditionally occurred and continues on the forest with sustained yield management principles and logging activities done in such a way as to minimize damaging effects to the land. Sustained yield management with extended rotations on Menominee ensures that the forest will always remain a native forest of mixed ages and composition. The management of the Menominee forest is ecologically viable, economically feasible, and socially desirable. This refers not only to forest products and social benefits, but also to wildlife, site productivity, and other ecosystem functions.

Management strategies:

Maintain active compliance with the current Menominee Tribal Enterprises Forest Management Plan. Continue landscape-level planning and management of the forest as well as individual stand-level management. Remain active with all national, state, local and tribal agencies that provide technical exchange of information and assistance.

Monitoring strategies:

Continue to maintain and update the forest inventory system that provides among other things, forest cover type, stand age and stand level information. Monitoring of the forest is done by updating stand information annually and by the analysis of Continuous Forest Inventory (CFI) plots that are measured every ten to fifteen years.

References:

Finley, R.W. 1976. Original vegetation cover of Wisconsin. Map compiled from U.S. General Land Office notes. University of Wisconsin Extension, Madison.

Frelich, L.E. 2002. Forest Dynamics and Disturbance Regimes: Studies from temperate evergreen-deciduous forests. Cambridge University Press.

Lancaster, K.F. 1985. Managing Eastern Hemlock a Preliminary Guide. NA-FR-30. U.S. Department of Agriculture, Forest Service, Northeast area.

Menominee Tribal Enterprises. 2005. Menominee Tribal Enterprises Forest Management Plan 1996-2005. Neopit, WI: Menominee Tribal Enterprises

Menominee Tribal Enterprises. 2012. Menominee Tribal Enterprises Forest Management Plan (Revised 1973) 2012-2027. Neopit, WI: Menominee Tribal Enterprises.

Wisconsin Department of Natural Resources. 2012. Ecological Landscapes of Wisconsin. Handbook 1805.1, Wisconsin Department of Natural Resources, Madison.

HCV 3

Forest areas that are in or contain rare, threatened or endangered ecosystems.

HCV areas on the Menominee forest: Type 1 old growth stands, type 2 old growth stands, Rushes Lake, Wolf River, Mesic cedar forest (S1)⁹, forested seep (S2), pine barrens (S2), oak barrens (S2), bedrock glade (S3), tamarack swamp (S3), northern hardwood swamp (S3), northern dry mesic forest (S3), northern dry forest (S3)

Assessment methods:

Consultation with MTE forestry staff including the Forest Manager (Marshall Pecore), the silviculture department (Tony Waupochick), the forest health department (Dr. David Mausel) and the inventory department (Paul Crocker). External consultations were held with the Wisconsin Wetlands Association, MITW Conservation (Donny Reiter) Benjamin Sands and Marc Abrams (Penn State Univ.) and the National Wild and Scenic River System. Relative documents pertaining to the assessment included the WDNR Ecological landscapes of Wisconsin handbook, the Wisconsin Natural Heritage Inventory, the USDA soil survey of Menominee County, Wisconsin, and the Menominee Tribal Enterprises Forest Management Plan and MTE inventory information.

Assessment explanation:

The Menominee forest is managed using sustained yield techniques across a wide range of different forest cover types, habitat niches, and age classes. Sustained yield forestry is management that ensures the resource harvested never exceeds the forest's natural ability to replace itself. This management philosophy recognizes the need for balance between the environment, community and economy, both in short term and for seven future generations. The result of this traditional management is the presence of old growth forests, pristine rivers and streams, and rare natural communities that have been preserved on the forest in many areas.

Type 1 and 2 old growth stands

The FSC standard definition of type 1 old growth equals an area three acres or more of forest that has never been logged and displays old-growth characteristics such as multiple large snags, pit and mound topography due to decaying standing snags and fallen trees, dense (high canopy) shade, and long-lived species. MTE also recognizes the importance of abundant coarse woody debris and scattered, natural openings in the super canopy caused by dead and dying dominant trees. The FSC standard definition of type 2 old growth equates to stands 20 acres and larger that have been logged, but which retain significant old-growth structures and functions.

⁹ Imperiled and rare natural communities according to Wisconsin Department of Natural Resources-Natural Heritage Inventory <http://dnr.wi.gov/topic/endangeredresources/communities.asp> (State element ranks; S1 = Critically imperiled; S2 = Imperiled; S3 = Rare)

Rare Natural Communities: Rushes Lake “Wetland Gem”, Wolf River, Mesic cedar forest (S1)¹⁰, forested seep (S2), pine barrens (S2), oak barrens (S2), bedrock glade (S3), tamarack swamp (S3), northern hardwood swamp (S3), northern dry mesic forest (S3), northern dry forest (S3)

The Wisconsin Wetlands Association has identified Rushes Lake and associated wetlands as one of the “most ecologically diverse forested wetland complexes in Northeast Wisconsin” and one of the States’ “Wetland Gems¹¹” (Appendix F). The Wolf River is listed as a National Wild and Scenic River¹² (Appendix G). Furthermore, the Wisconsin Natural Heritage Inventory lists several imperiled and rare natural communities (listed above) that are present on the Menominee Forest.

For example, pine barrens are a savanna community characterized by scattered jack pines, red pines, pin oaks, bur oaks, interspersed with shrubs, prairie willow, herbs and grasses (Wisconsin Natural Heritage Program. 2004). They are important since they have diminished in area and quality statewide. Great lakes barrens and bracken grasslands are rare communities that constitute less than 5% of the remaining barrens acreage. Barrens once occupied this area of Wisconsin known as the Northeast sands along with areas in southern Wisconsin in the Central sand plains (Ecological Landscapes of Wisconsin Handbook, 2011). A portion of the Menominee forest occurs in the Northeast sands area (Appendix D) with most of the landscape heavily forested with the exception of the very south eastern area. The soils that occur in this area of the forest are less fertile coarse textured, sandy soils (United States Department of Agriculture. 2004) This area is dominated by an overstory of varying densities of pin oak, red pine, white pine and aspen with a heavy understory of grasses, forbs and low shrubs (light pink and purples areas in Appendix E). There are small areas within these stands that have characteristics described as pine barrens although MTE has not designated any management areas other than a few small 1-2 acre wildlife openings on the forest (Figure 3).



Fig. 3. Photo taken 9/10/2014 in a red pine forest cover type in compartment 124, stand 670

¹⁰ Imperiled and rare natural communities according to Wisconsin Department of Natural Resources-Natural Heritage Inventory <http://dnr.wi.gov/topic/endangeredresources/communities.asp> (State element ranks; S1 = Critically imperiled; S2 = Imperiled; S3 = Rare)

¹¹ <http://wisconsinwetlands.org/gemslist.htm>

¹² <http://www.rivers.gov/rivers/wolf.php>

Assessment results:

Old growth

Type 1 and type 2 old growth classification: An analysis was performed on the forest inventory database (OpInv) to determine which stands met the criteria for Type 1 and 2 Old Growth. The FSC-US standard definitions were used. Much of the Menominee forest has been actively managed (i.e. logged) during the past 100 years, and therefore does not meet the qualifications of Type 1 Old Growth. There are, however, a few areas that have remained unlogged due to access issues. Of these, most are old growth cedar/swamp conifer wetlands. A few white pine stands in eastern Compartment 221 also meet the qualifications of Type 1 Old Growth.

Much of the western half of the forest is old growth in the northern hardwood cover type. These stands meet the definition of old growth according to the FSC-US standard. They contain many large, old sugar maple, basswood, and hemlock in excess of 150 years of age. Pit and mound topography dominates the landscape, and large snags and fallen trees are widely distributed throughout these stands. Many of the hardwood stands in eastern and central part of the forest are younger, and therefore do not yet meet the FSC-US standard. Some of these stands occasionally meet these criteria, but require stand-by-stand examination to verify this. This will occur as part of our annual stand examination process.

As of the writing of this action plan, we have restricted the Type 2 classification to large saw-timber northern hardwood stands west of the old rail line near Neopit, and hemlock or white pine-dominated stands that are at least 130 years old. MTE plans to regenerate many of the white pine stands using the shelterwood/seed tree regeneration system over the next 30 years. This is an effort to retain the diversity of species found in those stands over the long term. In addition, management of the white pine cover type ensures the diversity of white pine stand structures of all age classes across the forest. Therefore, the exact distribution of Type 2 Old Growth will gradually change across the landscape as the oldest stands are regenerated, with the acreage of Type 2 Old Growth being replaced by other stands that were regenerated many decades earlier. The FMP target for the white pine cover type is 36,500 acres, and given the current management schedule for this cover type, roughly to a quarter to one-third of the white pine acreage will remain in Type 2 Old Growth status at any one time. It should be noted that even within this group of stands, portions will be retained through the inclusion of retention pockets and external buffers (e.g. around wetlands, major roads, etc.).

Table 2. MTE has identified 6,545 acres of Type 1 Old Growth and 58,502 acres of Type 2 Old Growth. (AppendixG) illustrates their distribution on the Menominee forest.

Cover type	Old Growth			Acreage
	Classification	Type 1	Type 2	
White pine (PW)	Type 1	158		158
White pine (PW)	Type 2		10,609	10,609
Coniferous wetlands (CW and SC)	Type 1	6,387		6,387
Coniferous wetlands (CW and SC)	Type 2		14	14
Hemlock (HE)	Type 2		5,593	5,593
Hemlock hardwood mix (HH)	Type 2		728	728
Hemlock yellow birch (HY)	Type 2		56	56
Northern hardwoods (NH)	Type 2		34,705	34,705
Mid-tolerant hardwoods (NM)	Type 2		160	160
Oak-Pine (OP)	Type 2		18	18
Red pine (PR)	Type 2		62	62
Swamp hardwoods (SH)	Type 2		12	12
All Cover types (Total)	Type 1 + 2	6,545	51,957	58,502

Rare natural communities

Mesic cedar forests (S1)¹³, forested seeps (S2), pine barrens (S2), oak barrens (S2), bedrock glades (S3), tamarack swamps (S3), northern hardwood swamps (S3), northern dry mesic forests (S3), and northern dry forests (S3) exist on the forest. For example, the southeastern portion of the Reservation has stands of pin oak and mixed jack pine, white pine and red pine consistent with historical pine and oak barrens habitat (Figure 4). (Appendix E) identifies these areas as pin oak and red pine forest cover types (light pink and purple). Some of these areas have grass and shrub understory consistent with a pine barrens community. These areas are few and remain unmapped. Areas such as these in the less fertile sandier southeast corner of the forest are being actively manipulated as MTE continues a scheduled harvest to remove the aging pin oak and jack pine in the area. This will effectively create more areas of open landscape and with the addition of prescribed fire, a pine barren mosaic will be restored with the guidance of recent fire science research conducted on the Menominee (Sands and Abrams 2011).

¹³ Imperiled and rare natural communities according to Wisconsin Department of Natural Resources-Natural Heritage Inventory <http://dnr.wi.gov/topic/endangeredresources/communities.asp> (State element ranks; S1 = Critically imperiled; S2 = Imperiled; S3 = Rare)



Fig. 4. Photo taken 9/10/2014 in a red pine forest cover type in compartment 124 stand 670.

Management strategies:

Management considerations for preserving the HCVF type 1 old growth stands include: a continuous inventory system and schedule for monitoring the health and integrity of these areas, and a policy of no logging activities to preserve the sanctity of these areas. Management considerations for type 2 old growth stands include: a continuous inventory and schedule for stand updates within these areas, methods to minimize the impacts during harvests (ie. start dates, approved equipment, runoff and erosion mitigation management, best management practices for water quality and no activity areas), and compliance with all Tribal Ordinance requirements and state and federal regulations including NEPA and the Threatened and Endangered Species Act.

Management consideration for the maintenance and development of rare natural communities such as the pine barren mosaic in the southwest part of the Reservation will include the following:

- A continuous inventory system to identify current and potential areas for pine barrens consideration.
- A harvest schedule to salvage aging pin oak and jack pine while leaving varying densities of red and white pine.
- Maintain and update a fire protection procedure and management plan specific for this area.
- Review stands for prescribed fire management in order to manipulate these stands and promote pine barrens and native prairies in the southwest corner. Maintain active compliance with the current Menominee Tribal Enterprises Forest Management Plan.
- Continue the management goal of maximizing the quality and quantity of sawtimber grown under sustained yield management principles, while maintaining the diversity of native species.

- Continue maintaining and updating the forest inventory system as needed to determine HCV areas.
- Identification and mapping of HCVs as they apply to the FSC definitions is part of this action plan and is part of a long-term project that will be added to the MTE Silviculture handbook.

Monitoring strategies:

As the forest inventory is updated through the stand exam process, each stand will be reevaluated based on the aforementioned list of old growth characteristics and the old growth classification will be updated as circumstances warrant. Although management for old growth characteristics is in keeping with the current Menominee management philosophy, all silviculture prescriptions will address the FSC old growth standards to ensure that future management takes old growth attributes into consideration. As harvesting of pin oak and pine continues in the southeast part of the Reservation, areas portraying characteristics of grassland communities and pine barrens will be identified. Further identification and mapping of the other rare natural communities is planned in the future.

References:

Menominee Tribal Enterprises. 2012. Menominee Tribal Enterprises Forest Management Plan (Revised 1973) 2012-2027. Neopit, WI: Menominee Tribal Enterprises.

Sands, B.A. and Marc D. Abrams. 2011. A 183-Year History of Fire and Recent Fire Suppression Impacts in Select Pine and Oak Forest Stands of the Menominee Indian Reservation, Wisconsin. *The American Midland Naturalist*, 166(2):325-338. 2011.

Wisconsin Department of Natural Resources. 2012. Ecological Landscapes of Wisconsin. Handbook 1805.1, Wisconsin Department of Natural Resources, Madison.

Wisconsin Natural Heritage Program. 2004. Printable natural community descriptions [pdf]. Online: dnr.wi.gov/topic/endangered_resources/communities.asp. Wisconsin Department of Natural Resources, Bureau of endangered resources, Madison.

United States Department of Agriculture. 2004. Soil Survey of Menominee County, Wisconsin. United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with the Research Division of the College of Agricultural and Life Sciences, University of Wisconsin, and the Menominee Indian Tribe of Wisconsin.

HCV 4

Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control).

HCV areas on the Menominee forest: Wetlands in the Wolf River watershed immediately upstream from the Menominee county/Shawano county boundary, riparian wetlands within the Reservation

Assessment methods:

To review this standard required consultation with experts including staff from the Menominee Indian Tribe of Wisconsin Environmental Services Department (Jeremy Pyatskowitz), the MTE forestry inventory department (Paul Crocker), the MTE forest manager (Marshall Pecore), and the National Wild and Scenic Rivers System. Relative documents pertaining to the assessment included soil surveys, Wisconsin's Forestry Best Management Practices for Water Quality field manual, the Menominee County Land & Water Resource Management plan, the Menominee Tribal Enterprises Forest Management Plan and Menominee tribal and county ordinances regarding wetland protection and surface water were used.

Assessment explanation:

The geological makeup of the Reservation consists primarily of an uneven layer of glacial materials deposited over a mostly granite bedrock (United States Department of Agriculture. 2004, p.14). While the granite bedrock yields little if any groundwater, overlying glacial deposits may contain ample supplies. Areas with stratified deposits, especially sand or larger particles, are highly permeable and can be excellent sources of groundwater. Within the Reservation there are a high percentage of these stratified deposits and groundwater is usually plentiful and of good quality (Johnson, 2009, p. v). The topography of the Reservation is primarily a result of glaciation. The elevation ranges from about 1,433 feet above sea level in the northwest corner to about 841 feet in the southeast corner (United States Department of Agriculture. 2004, p.13). Slopes are generally gentle and range from zero to ten percent.

There are many lakes, streams and rivers within and flowing through the Reservation that supply abundant surface water. There are 187 streams and rivers, including the Wolf River, a component of the National Wild and Scenic Rivers Systems (Appendix I). The length of streams within the Reservation total of 380 miles (United States Department of Agriculture. 2004, p.13). The number of lakes with the totals 200 and covers approximately 4,081 acres. Most of the lakes are small, between one and fifty acres in size and remain undeveloped. There are developed larger lakes in the southeast corner of the Reservation that include; Legend, LaMotte, Southeast Bass and Moshawquit lakes. The number of wetlands totals approximately 35,429 acres (Menominee Tribal Enterprises, 2015). These include primarily shrub swamps, wooded swamps, marshes and bogs. Of this, 24,000 acres are riparian wetlands next to lakes and streams (Appendix K).

The Menominee Indian Tribe of Wisconsin (MITW) does not use its surface waters for irrigation or drinking. All of the drinking water is dependent on subsurface supply and reliance on a sole source aquifer (Cox, 2014). It is important to protect the surface water sources and regulate non-point source pollution, as these activities impact the ground water recharge systems. All of the groundwater receives recharge from both precipitation and surface water recharge, so it is important that the surface waters and wetlands remain clean. This is done through Tribal Environmental Regulation by development of the Menominee Tribal Code Chapter 512 (Ch.512) Surface Water (Menominee Indian Tribe of Wisconsin, 2004). This regulation acknowledges and establishes the policies necessary for the protection and

maintenance of the quality of surface waters and wetlands within the Menominee Reservation. Chapter 512 provides for a permit process that includes; stream crossings, water withdrawals and wetlands. Menominee Tribal Enterprises submits permit applications for all culvert placements and improvements for stream crossings and any wetlands crossings, including skid trails. Permits are evaluated on a case by case basis and approvals are issued by the MITW Environmental Department with proper design details. All crossings are designed to minimize erosion, protect streams from sedimentation and provide adequate passage for all aquatic life including fish. To protect drinking well water, the county and the Tribe have adopted ordinances such as the county's wellhead protection overlay district (section 24) in "The Menominee County Zoning Ordinance" (Johnson, 2009, p.9). This ordinance protects recharge areas for municipal wells.

Wetlands protection comes through the MITW Code Ch. 512, as well as implementation of Forestry Best Management Practices (BMP) for Water Quality that are approved through the MTE Forest Management Plan (Wisconsin Department of Natural Resources, 2010). The MITW Code Ch. 512 provides for wetland protection related to any activities directly affecting the wetland e.g.... road and trail crossings. The BMP's provide for protection of all other non-point source protections that occur as a result of general forestry activities e.g. skid trails, logging roads and equipment use. MTE also complies with MITW ordinance 05-22; amended 12-3-2009 (Menominee Indian Tribe of Wisconsin, 2004). The purpose of the ordinance is to provide added protection and preservation of water quality during the harvesting of timber within the Menominee forest. This is in addition to the Wisconsin State BMP requirements and includes more stringent wetland buffers to further protect and provide more water quality assurance. MTE's resulting cooperation with Tribal Environmental Services Department minimizes impacts to and maintains wetland integrity (Menominee Tribal Enterprises, 2012). Wetland protection within the Reservation has been key to maintaining excellent water quality and for the prevention of flooding in the Reservation communities.

Assessment results:

The drinking water for the local community is dependent on subsurface supply and on a sole source aquifer. Protection of surface water and the regulation of non-point source activities is vitally important to maintaining drinking water quality on Menominee. The Reservation communities and the communities downstream from the Wolf River riparian zone benefit from protection from stormwater and flooding due to the network of drainage patterns and storage and retention capacity of the Wolf River watershed. Filtration or storage of sediments, nutrients, or toxic substances is another important functional value of the watershed. These can be considered to be forest areas providing basic services of nature in critical situations. The topography is relatively flat with slopes generally gentle ranging from zero to ten percent making landslides and avalanches of no concern.

Management strategies:

MTE will continue to comply with all Menominee Tribal, federal and state government agencies that afford protection to watershed and surface water protection within the Menominee Reservation. The forest inventory system at MTE will be maintained and the MITW Environmental Services Department will continue a monitoring program of all surface waters within the Reservation.

Monitoring strategies:

Wetlands consist of a wide variety of habitat and are continually monitored through the long term forest inventory system at MTE as well as through MITW Environmental Services Department continual monitoring program of all surface waters within the Reservation. Inventory and monitoring have shown

that wetlands are in very good condition and through sound forestry and Tribal Regulatory practices, are not threatened by any current or future developments.

References:

Cox, D. 2014. Watershed and Surface Water Protection within the Menominee Reservation. Keshena, WI: Menominee Indian Tribe of Wisconsin Environmental Services Department.

Johnson, J. 2009. Menominee County Land & Water Resource Management Plan. Menominee County, WI: Menominee County Land Conservation Committee.

Menominee Indian Tribe of Wisconsin. 2004. Chapter 512: Surface Water. Retrieved from: <http://www.ecode360.com>.

Menominee Indian Tribe of Wisconsin. 2015. Keshena, WI: Menominee Indian Tribe of Wisconsin Environmental Services Department.

Menominee Tribal Enterprises. 2015. Neopit, WI: Menominee Tribal Enterprises Inventory Department.

Wisconsin Department of Natural Resources. 2010. Wisconsin's Forestry Best Management Practices for Water Quality Field Manual for loggers, landowners, and land Managers (PUB-FR-093). Madison, WI: Wisconsin Department of Natural Resources Division of Forestry.

United States Department of Agriculture. 2004. Soil Survey of Menominee County, Wisconsin. United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with the Research Division of the College of Agricultural and Life Sciences, University of Wisconsin, and the Menominee Indian Tribe of Wisconsin.

HCV 5

HCV forest areas fundamental to meeting basic needs of local communities

HCV areas on the Menominee forest: Areas on the Menominee forest where sustainable forest management provides economic ability of the local community to maintain their cultural identity.

Assessment methods:

To review this standard required consultation with local tribal members, MTE forestry staff and the MTE forest manager. Relative documents pertaining to the Menominee Tribe and the history of the Tribe were used. The Menominee Tribal Enterprises Forest Management Plan 2012-2027 was also referenced.

Assessment explanation:

The Menominee Indian Tribe has remained intact within their tribal homelands that they have continued to occupy for 10,000 years. The Menominee Indians today remain, as always, a woodland culture, continuing to seek subsistence from their environment. Early Menominee leaders, at the start of the Reservation era, recognized the importance of maintaining economic viability as a guiding principle. Providing employment opportunities to individual members is as much integral to a family's survival as it is to the economic survival of the community. They knew that there must be a balance within a sustainable system that is ecologically viable, economically feasible and socially desirable (Menominee tribal enterprises, 1997). These were the beginning principles of Menominee's forest management objectives that carry forward today. The Tribe's land ethic and management philosophy have always included Menominee's three guiding ecosystem management principles:

1. Forest management practices must be sustainable for multi-use access by both current and future generations.
2. The forest must be cared for properly to provide for the needs of people. Management must conserve the productive capacity of the land to produce forest products in order to sustain the Tribe's economy and improve tree quality to maximize the timber value of the trees that are harvested.
3. The forest's diversity must be maintained to ensure environmental health, balance and productivity.

This 160 year history of forest resource use and management provides testament that the Menominee forest can stand as a practical example of sustainable forest management as traditionally and currently practiced on Menominee (Menominee Tribal Enterprises, 2012). It considers not only forest products and social benefits, but also wildlife, site productivity, and other ecosystem functions. The impact of this management will maintain the structural composition of the forest into the future for many generations.

As such, it is important to point out that Menominee's natural resources are there to serve the Menominee people's needs. The Menominee cannot afford to conserve a wilderness preserve. "The Tribe's survival as a people depends on managing and protecting the health and productivity of the forest ecosystem (Menominee Tribal Enterprises, 1997).

Assessment results:

The Menominee forest provides opportunities for many purposes including hunting, fishing, trapping, gathering of berries, roots, firewood, medicinal plants and recreational uses. According to the definition of HCV5, although community members engage in these activities, obtaining these natural resources is not critical to their dependence. With access to tribal food distribution, health and wellness programs and tribal housing opportunities, these activities are considered to be more traditional, cultural and recreational in practice. It should be included that this area is considered to be the historical location where these indigenous community members have traditionally carried out economic, hunting, gathering and other cultural practices important to maintaining cultural identity (Menominee Tribal Enterprises, 2012).

The Menominee people today remain, as always, a Woodlands People. The forest continues to sustain through hunting, gathering and forest management/woods products manufacturing. The importance of the forest to their daily lives and survival as a people has not changed (Waupochick, 2014). Consideration for HCV5 can be envisioned as an ingrained ethic of cultural identity with the indigenous forested homeland endemic to the Menominee. Ownership of this tribal forest remains critical to the Menominee where no other surrounding comparably viable land base exists. The survival of the Menominee's identity is with the integral connectedness of the social and economic well-being that the forest and the annual timber harvest provide for the work force and community (Pecore, 2014).

Management strategies:

Maintain active compliance with the current Menominee Tribal Enterprises forest management plan. Continue the management goal of maximizing the quality and quantity of sawtimber grown under sustained yield management principles, while maintaining the diversity of native species. Remain active with all forest protection strategies involving weather, insects, diseases, fire and invasive species.

Monitoring strategies:

Periodically maintain and measure the Continuous forest inventory plots.

References:

Menominee Tribal Enterprises. 1997. The Menominee Forest Management Tradition: History, Principles and Practices. Neopit, WI: Menominee Tribal Enterprises

Menominee Tribal Enterprises. 2012. Menominee Tribal Enterprises Forest Management Plan (Revised 1973) 2012-2027. Neopit, WI: Menominee Tribal Enterprises.

Pecore, M (2014, December 11). Personal interview

Waupochick, A. (2014, December 31). Personal interview

HCV 6

Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

HCV areas on the Menominee forest: The Wolf river corridor, Compartment 223, Tribal burial sites, sites of cultural significance or sacred, and sites of historical significance

Assessment methods:

To review this standard required consultation with experts including local tribal members, the tribal historic preservation officer (THPO) for the Menominee (David Grignon), College of Menominee Nation Archaeologist (Dr. David Overstreet), Bureau of Indian Affairs Archaeologist (Tim Guyah) and the MTE forest manager (Marshall Pecore). Relative documents pertaining to the Menominee Tribe and the Menominee tribal website containing Menominee history were used. The U.S. forest Service and Menominee Tribal Enterprises Forest Management Plans 1996-2005 and 2012-2027 were also referenced.

Assessment explanation:

The Menominee Indian Tribe's rich culture, history, and residency in the area now known as the State of Wisconsin, and parts of the States of Michigan and Illinois, dates back 10,000 years (Menominee Indian Tribe of Wisconsin, 2014). The Menominee were known to occupy the area from the Upper Peninsula of Michigan south to Milwaukee and west to central Wisconsin (Appendix L). Before European contact, the Tribe's homeland was estimated to cover some 9 ½ million acres (Menominee Tribal Enterprises, 1997). Through a series of seven treaties (Appendix M) with the United States Government beginning in 1831, the Tribe witnessed its land base diminish to 235,000 acres (Menominee Indian Tribe of Wisconsin, 2014). The 1854 treaty between the Menominee Tribe and the United States government took place at Keshena falls, along the Wolf River and established the boundaries of the present day Reservation, within a portion of the Menominee Ancestral land. Two years later, the 1856 treaty again reduced the tribal land base by two townships in the southwest corner to create room for the displaced Stockbridge and Munsee peoples (Thomsen, 1999).

The Menominee Tribal Legislature (MTL) is aware that there are many cultural, historic and sacred sites in the forest and in places along the Wolf River (Appendix N). MTL recognizes the importance these sites provide to Menominee community members as a spiritual connection to their traditional cultural identity. Knowing these sites are protected and remain undisturbed brings a sense of pride to the Tribal members and allows them the opportunity to share with their children what their elders were able to share with them. In 1999 the MTL approved by Ordinance number 99-12 the Menominee Cultural Management Plan (Menominee Indian Tribe of Wisconsin, 2014). It is a tribal ordinance that affords protection to cultural resources on the Menominee Reservation and establishes guidelines for establishing the Tribal Register of Historic Places. In 2004, the legislature developed the Menominee Language & Culture Commission (Menominee Indian Tribe of Wisconsin, 2014). The purpose of the commission is "To preserve, protect and promote the rights of the Menominee Nation and to follow the mandates of the Language & Culture Code Ordinance 96-22" (Menominee Indian Tribe of Wisconsin, 2014). Monthly meetings of the commission are open to Tribal members including the THPO, with all recommendations of the commission sent to the Menominee Tribal Legislature.

MTE's role in management and planning focuses on maintaining a description of action to ensure cultural sites are protected during forest management activities (Menominee Tribal Enterprises, 2012). Harvesting activities are prohibited within any known archeological sites as determined by BIA archeologists and the THPO (Menominee Tribal Enterprises, 2005). NEPA compliance is also met as part of the management process and includes a review of all proposed logging areas. Due to cultural sensitivities, MTE will not explicitly map cultural sites on the forest. That role has traditionally been served by the office of the THPO. MTE's commitment to the identification and protection of these areas constitutes a strong commitment to maintaining high conservation values areas on the Tribal forestlands.

The Wolf River Corridor and Compartment 223 were designated as special management areas as a result of a public input process and identified social values. MTE recognizes these special management areas and tracks them in the forest inventory (Appendix K). The identified areas total 12,969 acres and includes those areas within the Wolf River Corridor and Compartment 223. The Wolf River flows from north to south through the traditional territories of the Menominee. Keshena falls, located on the river has further importance as the site where Menominee's harvested sturgeon that came up river to spawn in the springtime (Thomsen, 1999). It was also the location where the 1854 treaty was signed between the Menominee Tribe and the United States which finalized the location of the present day Reservation. In 1968 the National park service designated the Wolf River as a wild and scenic river for a 24 mile stretch within the Reservation boundaries from the Langlade County line downstream to Keshena Falls (National Park Service, n.d.). This act provided protection to the water quality and prohibited shoreline development along this stretch of river. Compartment 223 is removed due to a high concentration of cultural resources including traditional burial mounds, family cemeteries and ceremonial sites (Menominee Tribal Enterprises, 2012). MTE has engaged in inter-agency planning efforts regarding the allowable fire response activities within this compartment necessary to protect the identified values.

Assessment results:

The Wolf River Corridor and Compartment 223 are HCVs. Other cultural/significant sites found throughout the Menominee Reservation are also HCVs but remain unmapped and confidential property of the Menominee Tribe in accordance with Tribal ordinances, NEPA and the National Historic Preservation Act (NHPA). Knowing these sites are designated and remain undisturbed brings a sense of pride to the tribal community and creates a spiritual connection to their traditional cultural identity.

Management strategies:

The Wolf River Corridor and Compartment 223 will remain an area of no forestry activity and proper buffers will be placed around these areas. MTE will continue to comply with all MTL, federal and state government agencies that afford protection to cultural resources on the Menominee Reservation. MTE will address all archeological concerns by walkovers of sensitive areas identified in maps (provided previously by MTE) reviewed by the THPO. Harvesting activities will be prohibited within any archeological sites and buffers will be placed around known sites.

Monitoring strategies:

The THPO and select MTE staff will continue to strive to identify and monitor all known sites within harvest areas pre- and post- logging.

References:

Davis, T. 2000. Sustaining the forest, the people, and the spirit. New York : State University of New York Press.

Menominee Indian Tribe of Wisconsin. (n.d.) Retrieved December 15, 2014, from: <http://www.menominee-nsn.gov>

Menominee Tribal Enterprises. 2005. Menominee Tribal Enterprises Forest Management Plan 1996-2005. Neopit, WI: Menominee Tribal Enterprises

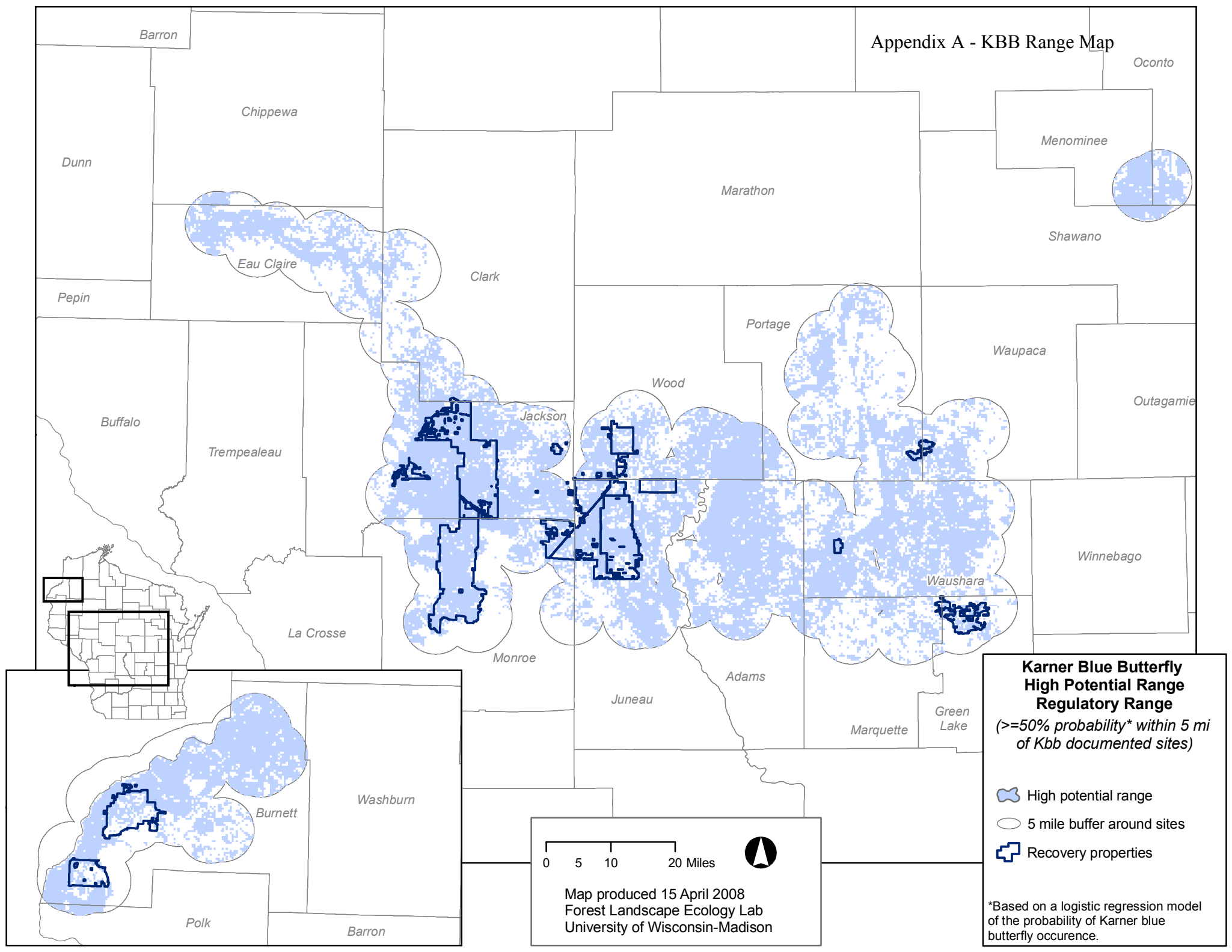
Menominee Tribal Enterprises. 1997. The Menominee Forest Management Tradition: History, Principles and Practices. Neopit, WI: Menominee Tribal Enterprises

Menominee Tribal Enterprises. 2012. Menominee Tribal Enterprises Forest Management Plan (Revised 1973) 2012-2027. Neopit, WI: Menominee Tribal Enterprises.




National Parks Service. (n.d.) Retrieved December 21, 2014 from: <http://www.nps.gov/index.htm>

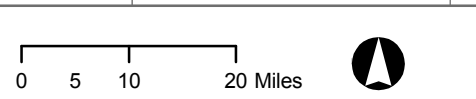
Thomsen, C., H. Neuman, & Schuttler, J.F. (1999). Forests of the Menominee: Forest resource management on the Menominee Indian Reservation 1854-1992. Montana: Heritage Research Center, Ltd.

Appendix A - KBB Range Map



**Karner Blue Butterfly
High Potential Range
Regulatory Range**
 (>=50% probability* within 5 mi
 of Kbb documented sites)

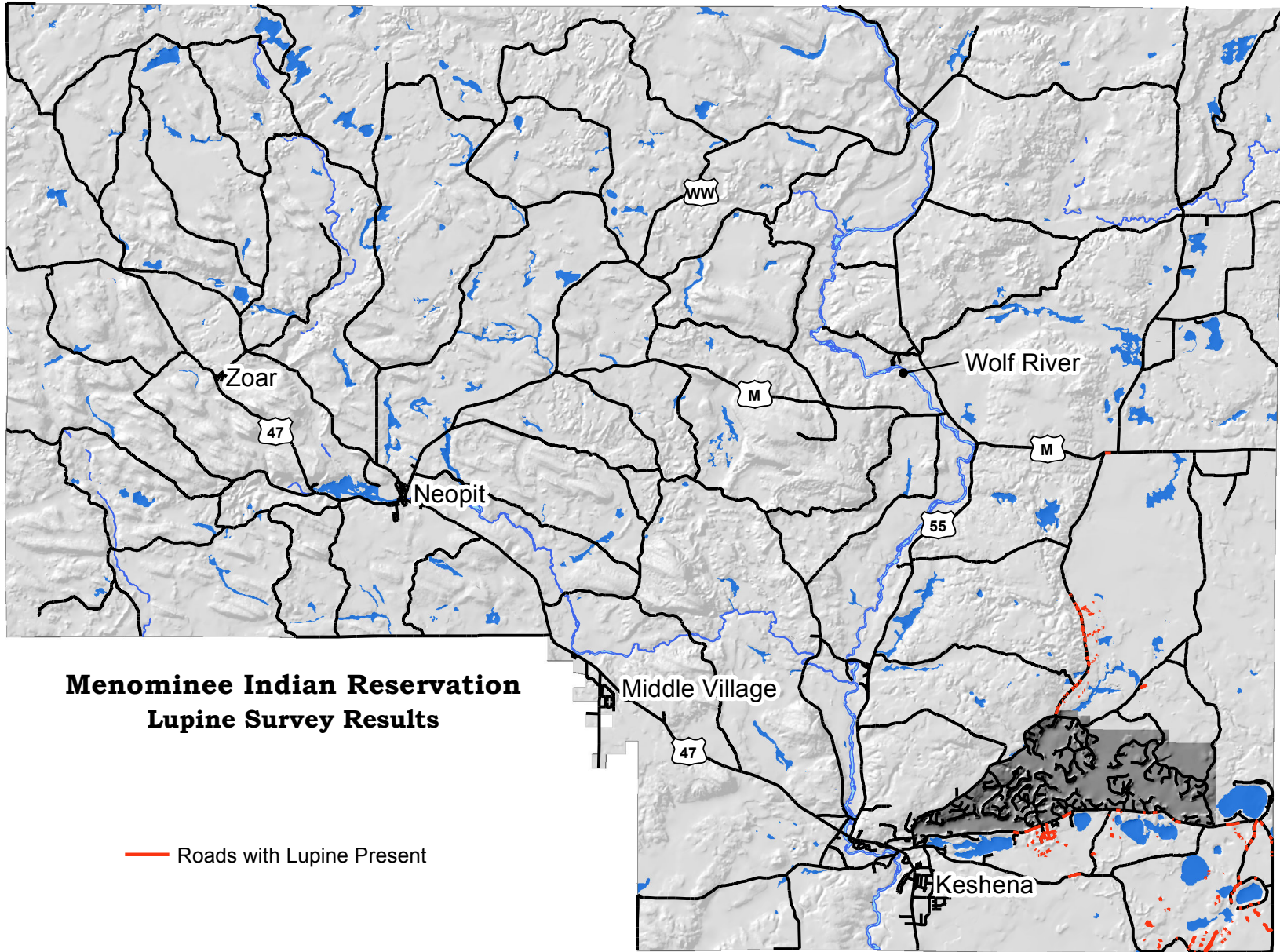
-  High potential range
-  5 mile buffer around sites
-  Recovery properties



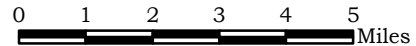
Map produced 15 April 2008
 Forest Landscape Ecology Lab
 University of Wisconsin-Madison

*Based on a logistic regression model of the probability of Karner blue butterfly occurrence.

Appendix B - Lupine Survey Map



Updated On: Jan 9, 2015



MTE Confidential: Do not distribute, forward, or reproduce

MENOMINEE TRIBAL ENTERPRISES



FINE HARDWOODS - PINE - HEMLOCK

GENERAL OFFICE: P.O. BOX 10 - NEOBIT, WI 54150

PHONE: 715/756-2311 - LBR. SALES: 715/756-2287 - FAX: 715/756-2386

FORESTRY CENTER: P.O. BOX 670 - KESHENA, WI 54135

PHONE: 715/799-3896 - FAX: 715/799-4323

****MEMO****

TO: Marshall, Mike Lohrengel, Angela
FROM: Dave Mausel, Forest health EXT. 2246
DATE: 4 Sep 2014, updated 12 Nov 2014
RE: Use of logging roads that have lupine in the traveled way

Dear all,

I spoke with Diane Brusoe, WI DNR Karner Blue Partnership Coordinator, on 4 Sep 2014, concerning the proposed intermediate thinning and sanitation logging in fully stocked closed canopy forests (>36 years old) in compartment 123. We discussed the fact that, ultimately, the planned forest management activities will enhance KBB habitat. She spoke with her agencies field staff and concluded that using the travelled way of a logging road, even if the road has populations of wild lupine and the status of Karner blue presence/absence is not known, is not a “permanent take” and it is “o.k.” to use the roads.

As such, please follow these best management practices based on the WI-DNR habitat conservation plans user guide’s protocols for corridor management, timber stand improvement, timber harvest, and snow plowing⁷.

1. Do not allow any road maintenance, dragging, or other road improvement in road segments with lupine, as determined by mapping surveys done in 2013 and earlier.
2. All traffic must remain in the travelled way in the segments of the road with wild lupine. No vehicles or machinery are allowed on the shoulder for any reasons such as forwarders/skidder entering into the stand, passing, parking, breakdowns, etc.
3. Do not deck logs or pile slash near road segments with lupine.
4. All the above also apply to frost pockets and other open areas > ¼ acre within the stand, as the presence of KBB there is not known.
5. Snow plowing, if necessary, must follow the snow plowing protocol

⁷ <http://dnr.wi.gov/topic/ForestPlanning/hcpGuide.html>

Appendix D

Ecological Landscapes of Wisconsin (Wisconsin Department of Natural Resources, 2012)

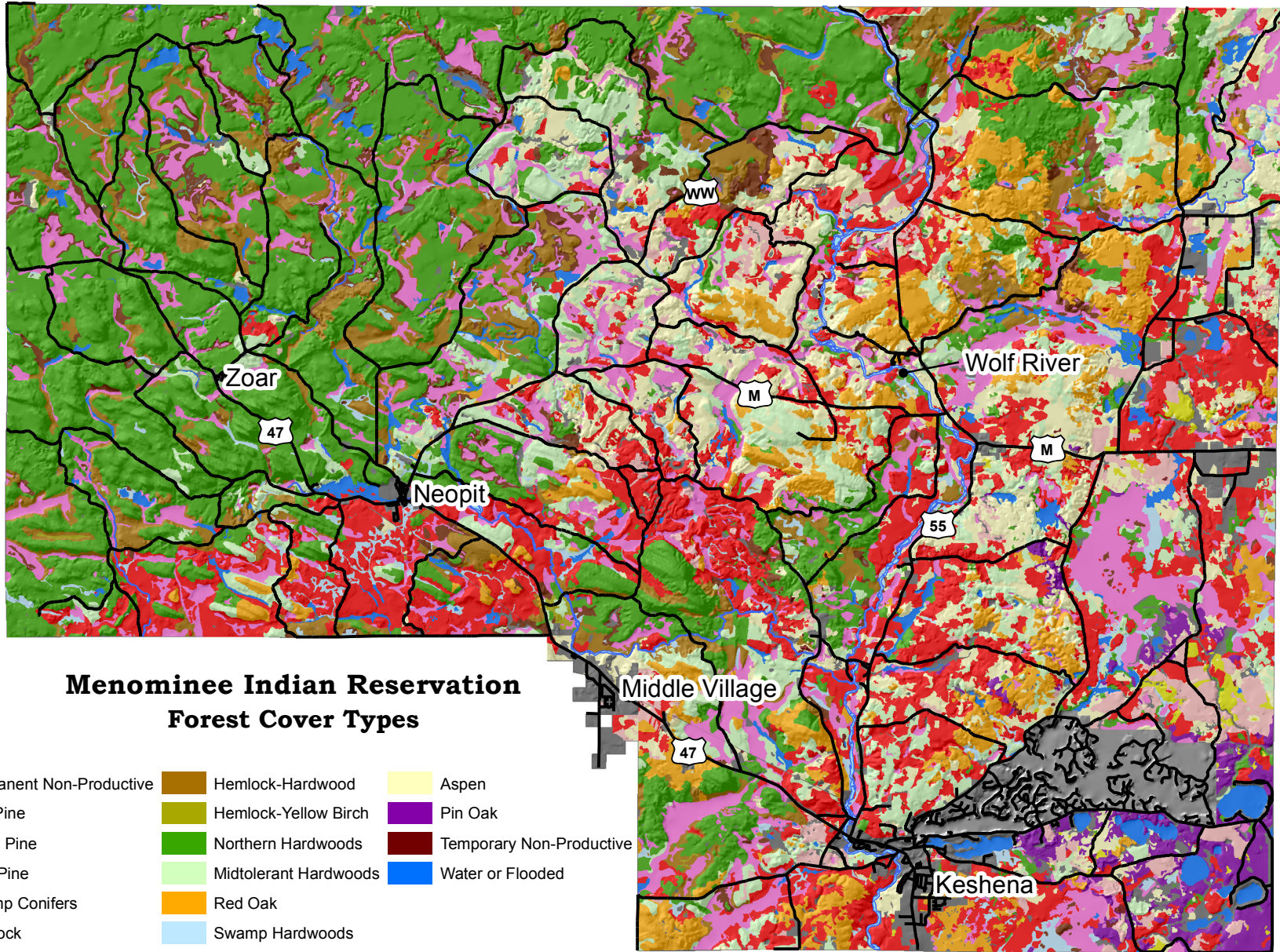


Wisconsin was divided into 16 ecoregions with similar ecology and management opportunities. Each of these ecoregions is called an Ecological Landscape. The Ecological Landscapes are based on the National Hierarchical Framework of Ecological Units (NHFEU; Cleland et al. 1997). There were too many NHFEU Subsections and too few NHFEU Sections to be useful for management purposes. Ecological Landscapes use the same boundaries as NHFEU Sections or Subsections. However, some NHFEU Subsections were combined to reduce the number of geographical units in the state to a manageable number. Therefore, Ecological Landscapes are at a size (scale) between NHFEU Sections and Subsections.

- Ecological Landscapes
- County Boundaries



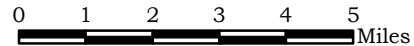
Appendix E - Cover Type Map



Menominee Indian Reservation Forest Cover Types

- | | | |
|--------------------------|-----------------------|--------------------------|
| Permanent Non-Productive | Hemlock-Hardwood | Aspen |
| Red Pine | Hemlock-Yellow Birch | Pin Oak |
| White Pine | Northern Hardwoods | Temporary Non-Productive |
| Jack Pine | Midtolerant Hardwoods | Water or Flooded |
| Swamp Conifers | Red Oak | |
| Hemlock | Swamp Hardwoods | |

Updated On: Jan 9, 2015



MTE Confidential: Do not distribute, forward, or reproduce



RUSHES LAKE WETLAND TYPES

Coniferous swamp, coniferous bog, open bog, marsh

Menominee Indian Tribe

MEMONINE COUNTY



RUSHES LAKE

Property Owner: Menominee Indian Tribe of Wisconsin
 Recognitions & Designations: WI Land Legacy Place, WI Bird
 Conservation Initiative Important Bird Area

Funding for this project provided by the Wisconsin Coastal Management Program and the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management under the Coastal Zone Management Act, Grant #NA07NOS4190064.

 Wisconsin
 Wetlands
 Association
 wisconsinwetlands.org

ECOLOGY & SIGNIFICANCE

Located in eastern Menominee County/Reservation, this Wetland Gem harbors what is considered to be one of the most ecologically diverse forested wetland complexes in Northeast Wisconsin. The site features a complex of nearly 750 wetland acres associated with Rushes Lake, Jackson Creek, Long Marsh and an unnamed lake adjoining Rushes Lake. Rushes Lake is made up of a shallow, soft-water lake surrounded by a vast complex of coniferous bog, open bog and other northern wetland plant communities. Large adjacent areas of upland forest increase the wildlife value of these wetlands, which are home to a number of rare plant and animal species. The Menominee Tribe of Wisconsin considers this site special because of the types of wetlands and diversity of plants and animals. Rushes Lake is a popular destination for tribal hunting and wildlife watching.

FLORA & FAUNA

Rushes Lake is surrounded by a wide, open bog mat of sphagnum moss, sedges, rushes and low shrubs. The mat's soils are peaty and hummocky, providing conditions that support an unusual diversity of plant species. Plants common in the sphagnum mat include bog clubmoss, swamp laurel, bog rosemary, leatherleaf, Labrador tea, speckled alder, cranberry and bulrush. Surrounding the open lake is coniferous bog habitat dominated by tamarack and black spruce with occasional northern white cedar. The upland

forested areas include northern red oak, yellow birch, white birch, red pine, white pine and American beech.

Several mammal species make use of Rushes Lake wetlands, including snowshoe hare, mink, fisher, muskrat, beaver, black bear and deer. Bird species found at the site include robin, white-throated sparrow, Nashville warbler, common yellowthroat, mallard, blue-winged teal, American black duck and cedar waxwing. Game species include the ruffed grouse and eastern wild turkey. The site also supports several rare and interesting bird species, including common loon and American bittern, and has been home to a pair of bald eagles for more than twenty years. Amphibians are numerous and include bull frog, chorus frog, leopard frog, spring peeper and eastern gray tree frog. Snakes include garter, eastern hognose and pine.

THREATS

With the onset of global warming, invasive species have become a serious threat. Invasive plants like reed canary grass and Phragmites (common reed grass) are of particular concern. Future invasion by the emerald ash borer beetle threatens the area site's ash stands. The Menominee Tribe and its partners are developing an invasive species management plan that will be completed in late 2009. Heavy deer browsing pressure threatens the regeneration of the site's conifer trees.

ACCESS

The Menominee Indian Tribe of Wisconsin has deemed this area private and not open to the public.



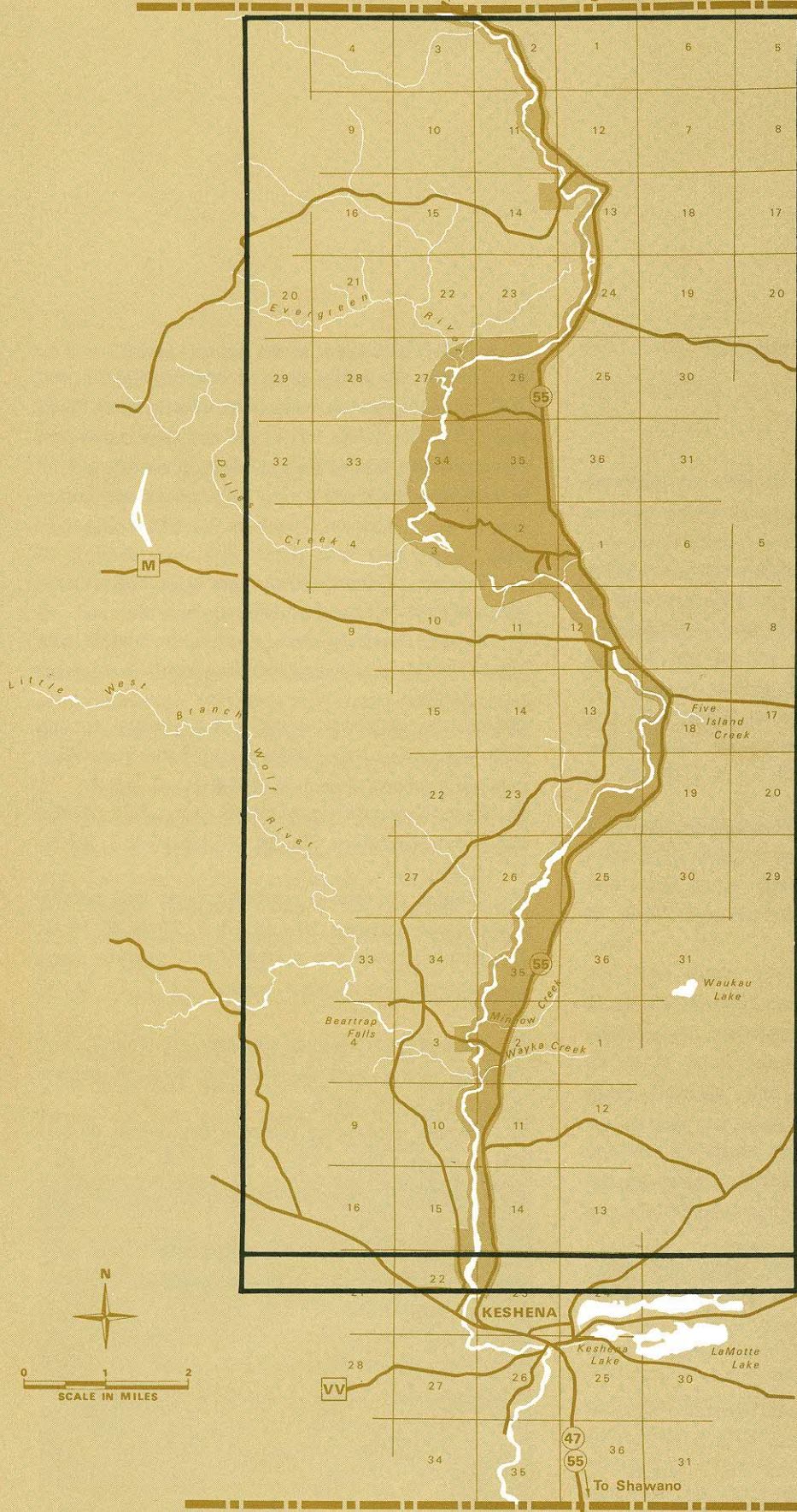
Wolf pup — Menominee Indian Tribe



Western chorus frog — Allen Blake Sheldon

Sources:

Menominee Conservation Fish and Wildlife Department
 Wisconsin Land Legacy Report (WDNR)
 Wisconsin Important Bird Areas (WCBI)



**SCENIC
RIVER
AREA
23.5 MILES**

**RECREATIONAL
RIVER
AREA
.5 MILES**

**RIVER CLASSIFICATION
WOLF NATIONAL SCENIC RIVERWAY
MENOMINEE COUNTY**

The administrative policies applicable to a particular area in the Wild River classification depend upon the Management Category assigned to it in the Management Statement.

SCENIC RIVER AREAS

Rivers and sections of rivers in the Scenic Rivers classification are free of impoundments and appear from the water or shorelines to be largely undeveloped. Public roads and other provisions for motorized access may exist or be developed along the river at intervals usually not closer than two hours travel distance.

To protect the scenic and recreational values of the river and its shoreline from the sight and sound of vehicular traffic, no roads or trails for motor vehicles should be located parallel to and in close proximity with the river.

Motorboats usually are prohibited in Scenic Rivers; however, they may be permitted within certain segments where their use already is well established or where their use may be considered necessary for enjoyment of scenic values. Where motorboats are permitted, regulations may be issued to control the type and size of the engines.

Simple campgrounds and boat launching facilities may be provided at deadend roads and where roads cross the river. To the extent possible, these should be screened from the river. Simple comfort and convenience facilities, such as fireplace grills, shelters, and toilets, may be provided along the shorelines to enhance the recreational experience and to protect popular sites.

Structures or installations essential for administration of the area or for resource use should be located and designed to protect scenic values to prevent undue interference with recreational use. These may include such items as water measuring

devices, water diversions, water transmission ditches and livestock fences. Occasional unobtrusive recreational residence in a relative natural setting or occasional farms will not preclude Scenic River classification.

Administrative policies for recreation areas of the National Park System will apply to Scenic Rivers.

RECREATION RIVER AREAS

Rivers and sections of rivers in the Recreation River classification may be readily accessible by public roads, railroads, or other forms of transportation. Public roads or railroads may run along its shorelines. The rivers may have undergone some impoundment or diversion in the past and light development may occur occasionally along their shorelines. They may flow through lands used for agricultural purposes including farming and livestock grazing.

Conventional campgrounds and picnic areas may be located close to the river. Motorboats are permitted and marinas may be provided for boat access, servicing and docking.

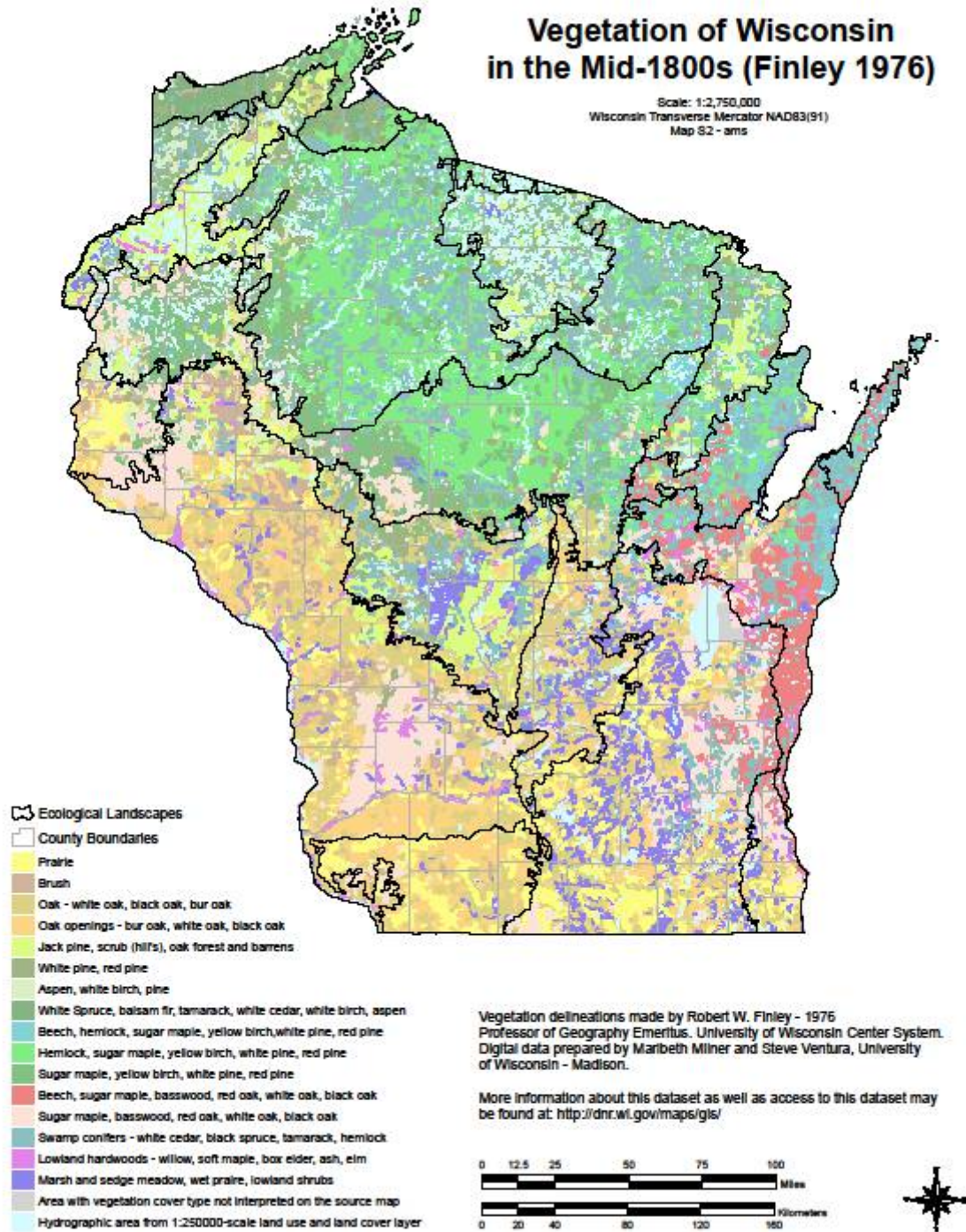
Other resource uses and activities within the Recreation River must not degrade the quality of the environment or the setting in which the recreational activities occur.

Administrative policies for recreation areas of the National Park System will apply to recreational river areas.

Based upon the above criteria the Wolf River, from the Langlade-Menominee County line south 23.5 miles to a point on the north line of Section 22-23 T28N, R15E, is classified as Scenic River Area. From the north line of Section 22-23 to Keshena Falls, approximately 1/2 mile, is classified as Recreational River Area.

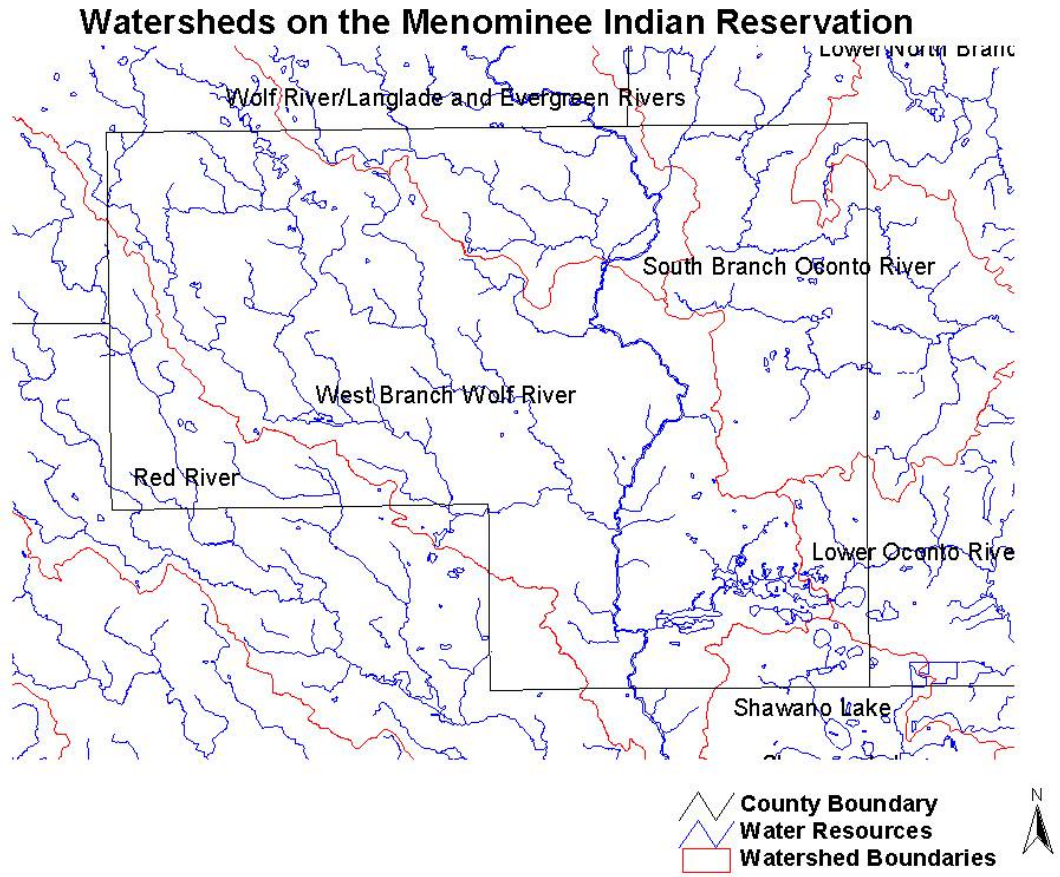
Appendix H

Wisconsin land cover in the mid-1800s (Finley, 1976)

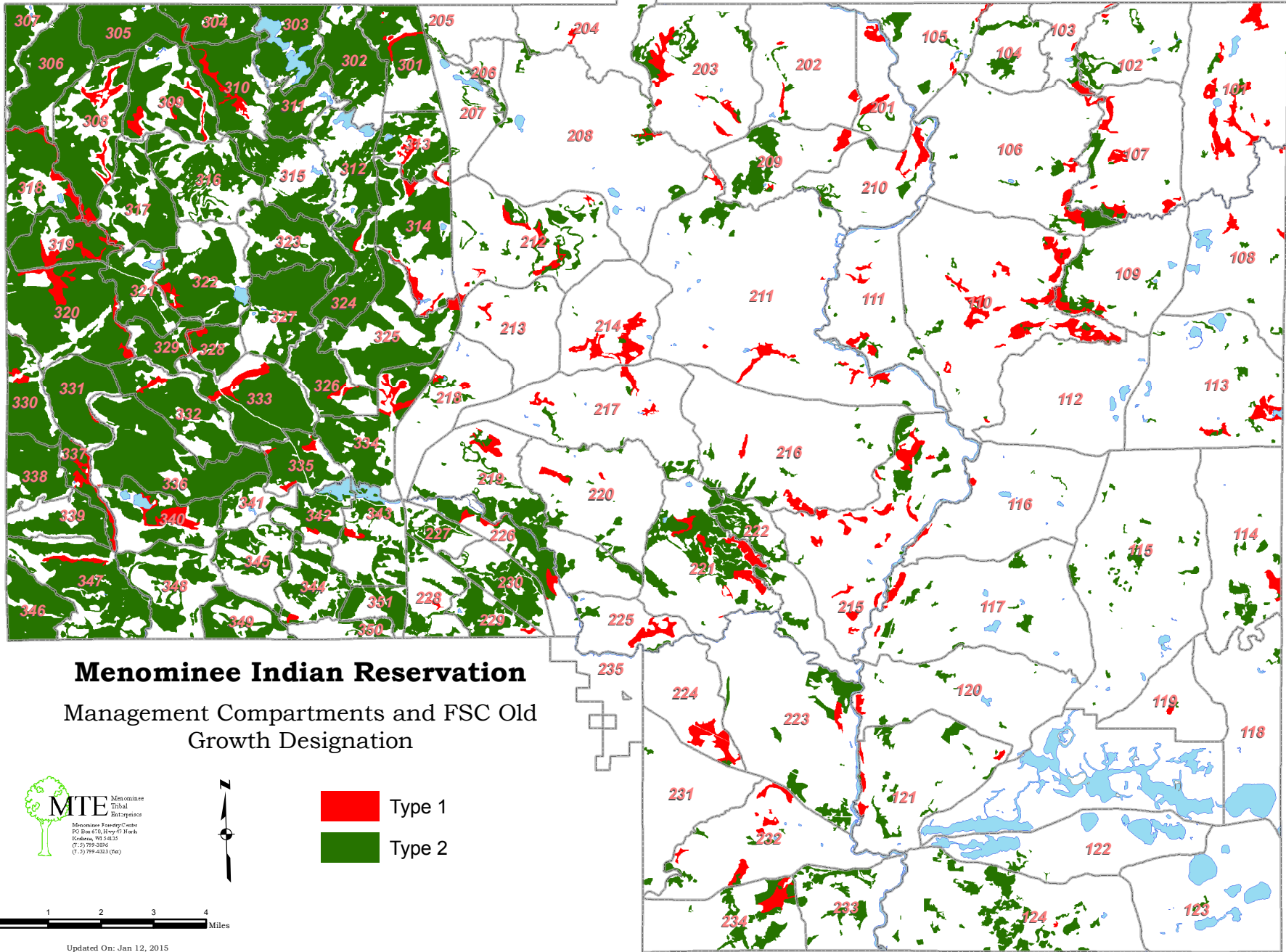


Appendix I

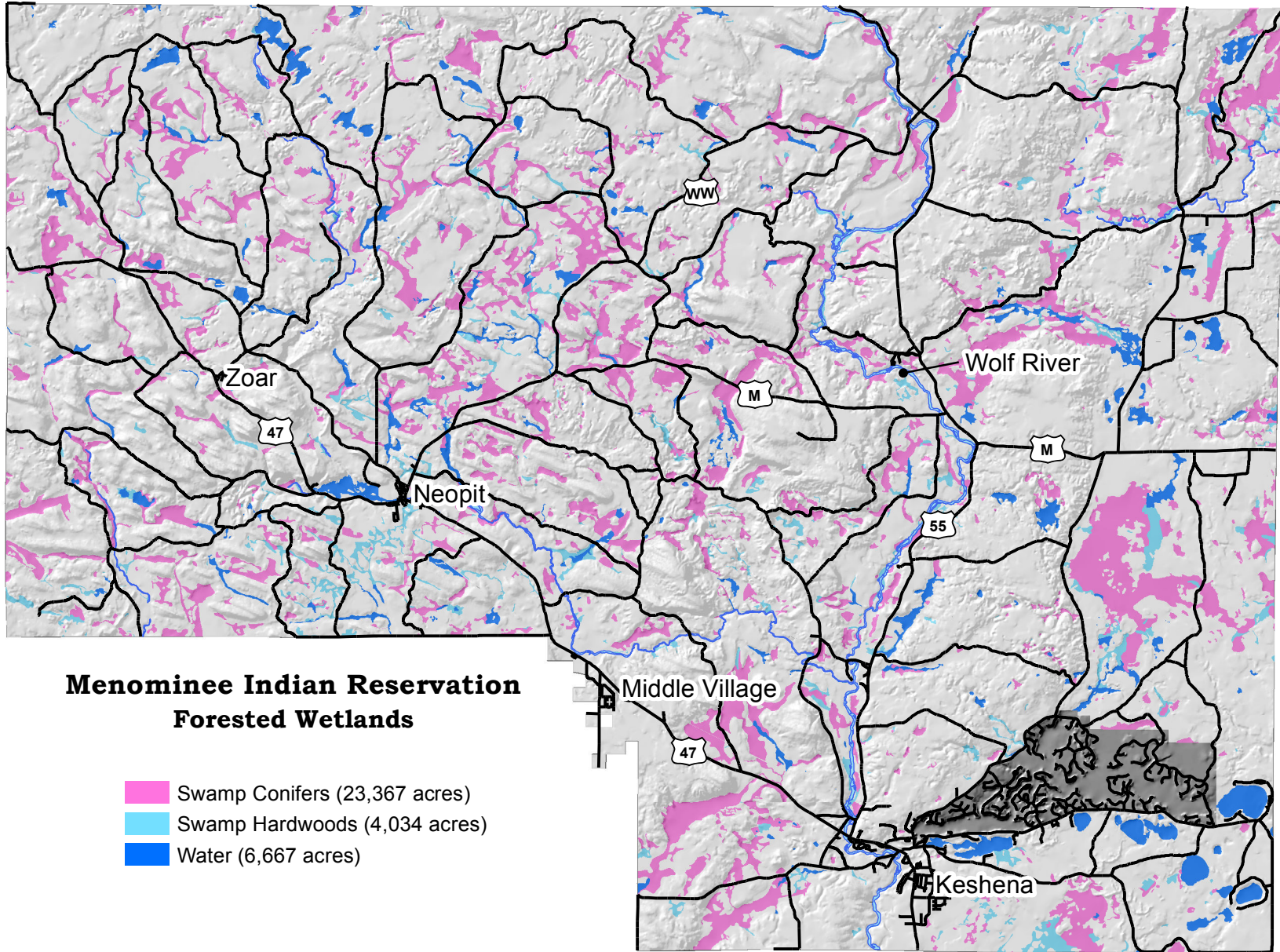
Watersheds on the Menominee Indian Reservation (Menominee Indian Tribe of Wisconsin, 2015)



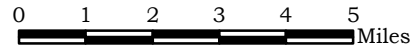
Appendix J - Old Growth



Appendix K - Forested Wetlands Map



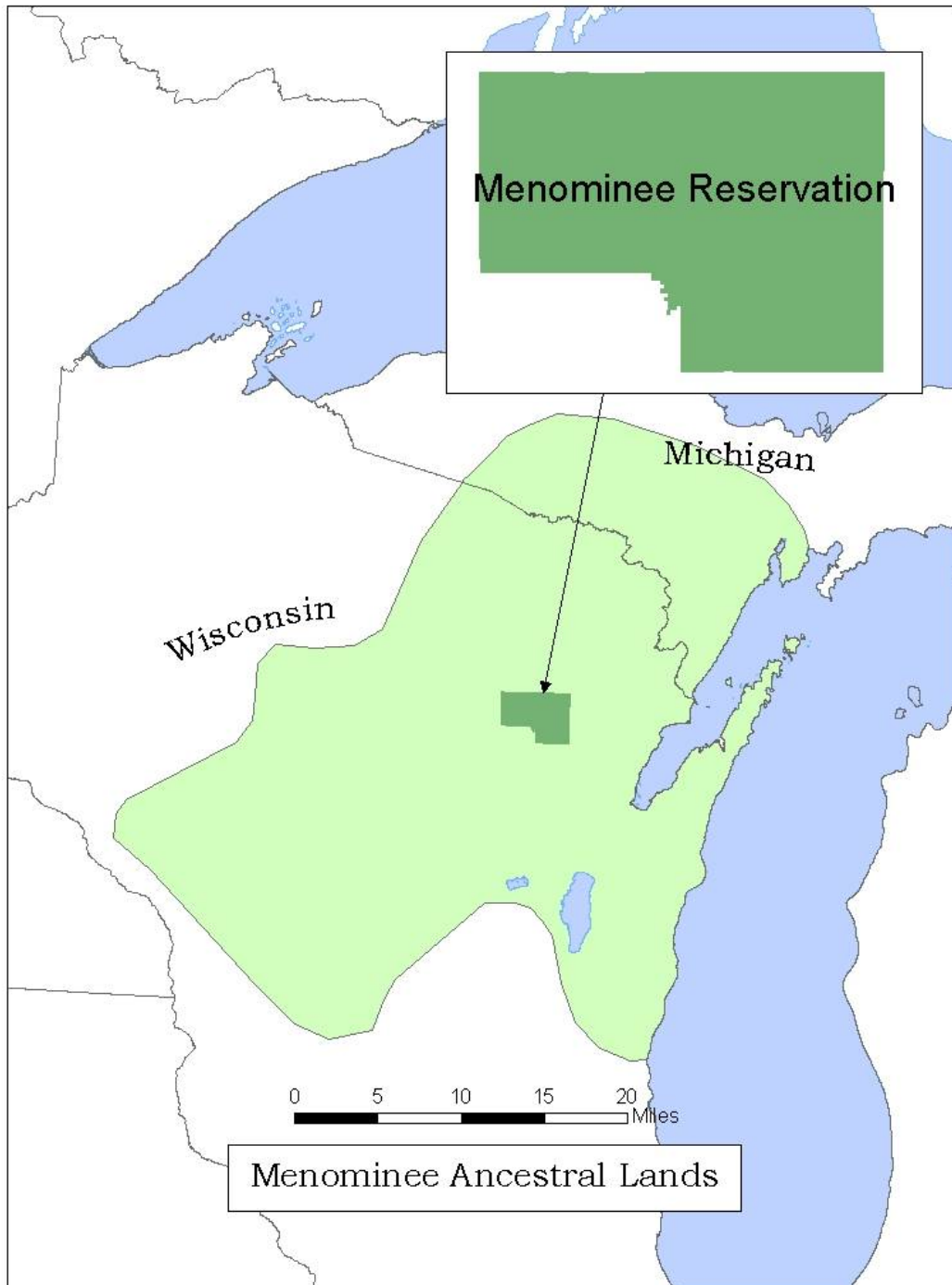
Updated On: Jan 9, 2015



MTE Confidential: Do not distribute, forward, or reproduce

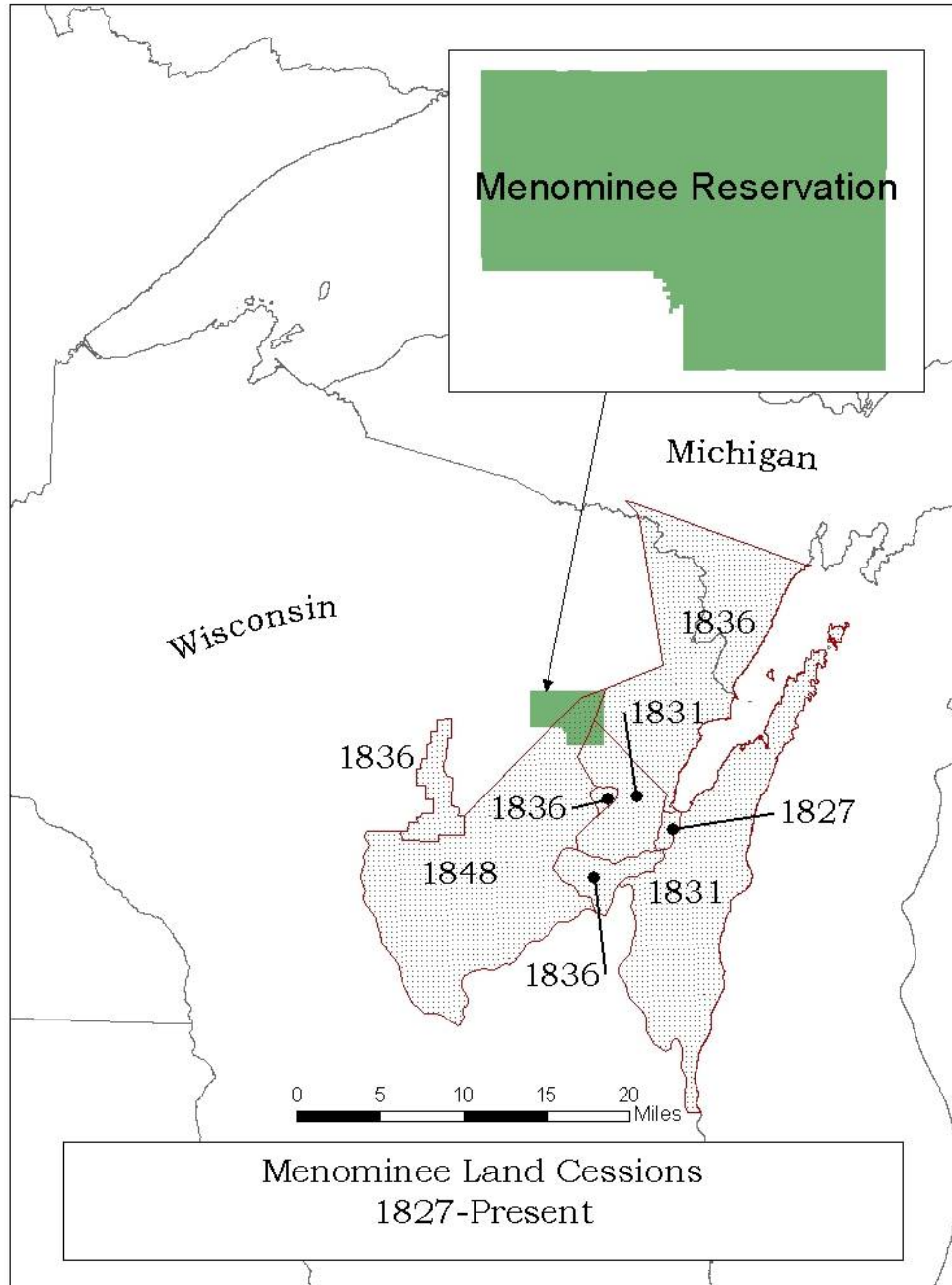
Appendix L

Menominee territories prior to 1831 (Modified from Menominee Tribal Enterprises, 1997)

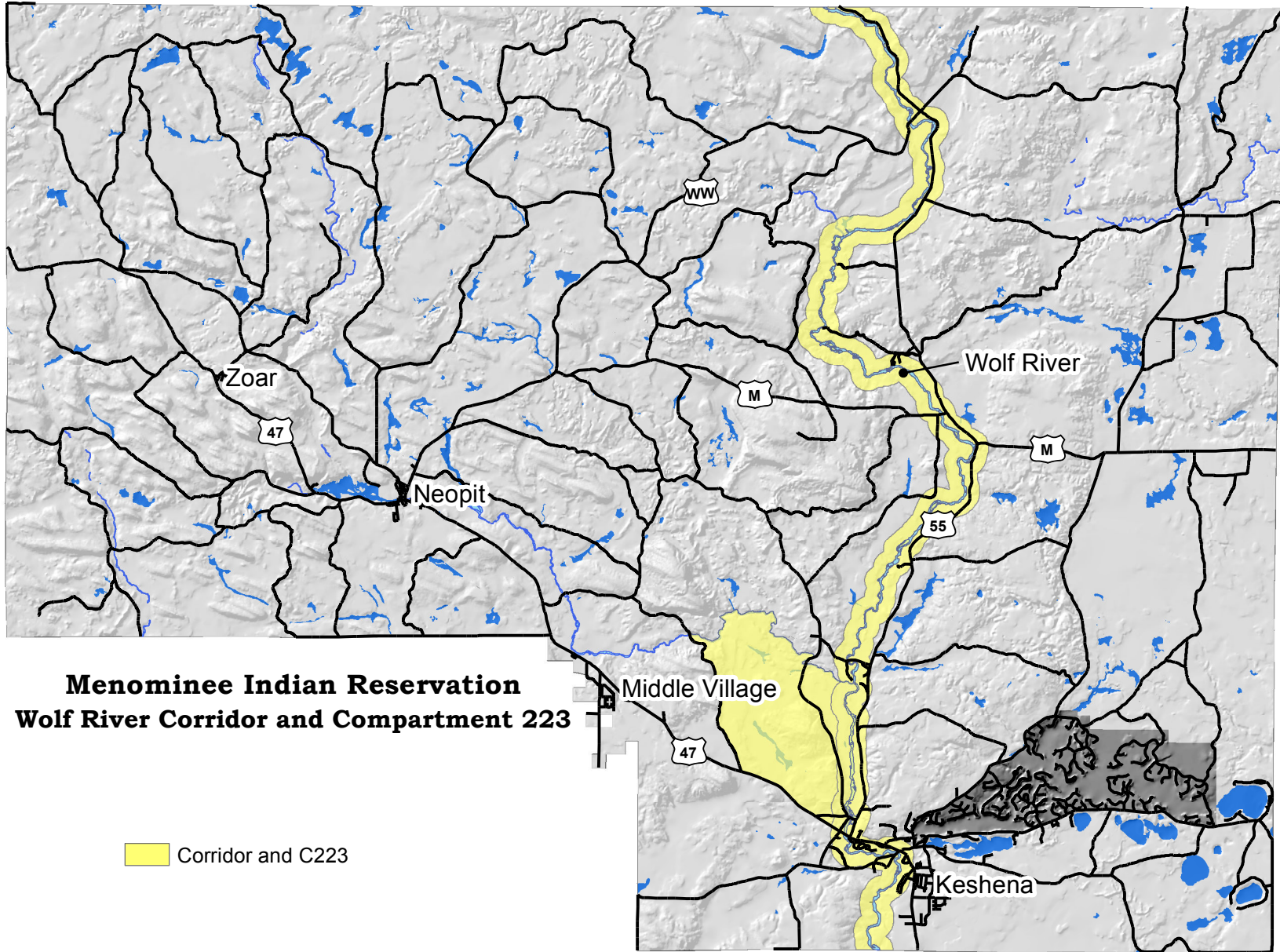


Appendix M

Menominee land cessions, modified from (Davis, 2000).



Appendix N - Wolf River Corridor and Compartment 223



**Menominee Indian Reservation
Wolf River Corridor and Compartment 223**

Corridor and C223

Updated On: Jan 9, 2015

0 1 2 3 4 5 Miles

MTE Confidential: Do not distribute, forward, or reproduce