APPENDIX

Appendix A: Glossary of Terms

Appendix B: References

Appendix C: Ecological attributes of the Northern Highland-American Legion State Forest

Appendix D: Special of Special Concern, Wisconsin State Threatened and Wisconsin State Endangered Species within the Northern Highland-American Legion State Forest

Appendix E: State Natural Areas

Appendix F: Natural Resources used by Local Native American Tribes

APPENDIX A: GLOSSARY OF TERMS

Active Management: the goals of the native community management area would be in part or mostly achieved through active manipulation of the vegetation. Although each native community management area has different goals and objectives, most of the goals are to develop the composition and characteristics of old-growth forest. In many native community areas, the tree composition is dominated by a few species and the diversity can be enhanced through active management (often times timber harvest) techniques. Forest users can expect some activity during the life of the master plan, but many portions of the area would age naturally.

Adaptive Management: A dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used, along with research results, to modify management on a continuing basis to ensure that objectives are being met.

Basal Area: The basal area of a tree is usually defined as the cross-sectional area at breast height in square feet.

Biological Diversity: The variety and abundance of species, their genetic composition, and the communities, ecosystems and landscapes in which they occur. Biological diversity also refers to the variety of ecological structures, functions, and processes at any of these levels.

Ecological Reference Sites: Ecological reference areas are places on the landscape managed primarily for their ecological values. Management considerations for production of forest products, wildlife habitat for game species, recreational activities, and other natural resource objectives are secondary, though some may be compatible with benchmark management. Benchmarks provide a framework for improving our understanding of ecological systems and changes occurring within them, as well as for evaluating the consequences of management actions and the impacts, past and present, of humans on the landscape. They can also provide historical ecological context to bridge the past with the present.

Community Restoration: recognizes that communities, species, structural features, microhabitats, and natural processes that are now diminished or absent from the present landscape have a valuable role to play in maintaining native ecosystems. (Biotic Inventory and Analysis of the NH-AL State Forest, 1999) Under some definitions, community restoration means moving the current composition and structure of a plant community to a composition and structure that more closely resembles that of the pre-settlement vegetation. (Community Restoration and Old Growth on the NH-AL State Forest Assessment, 2001)

Drumlins: Were formed by erosion and deposition of materials beneath the glacier.

Eskers: Are ridges composed of sand and gravel that were deposited by streams which flowed beneath the glacier.

Extended Rotation Stands: can be either even or uneven aged. They are managed well beyond the economic rotation to capture ecological benefits associated with mature forests. These stands are carried beyond their normal economic rotation age and are harvested before reaching pathological decline.

Forest Cover Type: A category of forest usually defined by its vegetation, particularly its dominant vegetation as based on percentage cover of trees.

Focus Sites: In this document, Focus Sites refer to designated sites that would be managed for old growth characteristics or other ecological features such as pine barrens in the uplands and protection of wetlands and water resources in the lowlands.

Invasive Species: These species have the ability to invade natural systems and proliferate, often dominating a community to the detriment and sometimes the exclusion of native species. Invasive species can alter natural ecological processes by reducing the interactions of many species to the interaction of only a few species.

Managed Old Growth: stands are differentiated from old growth reserves by designated management commitments. The primary management goal is the long-term development and maintenance of old growth characteristics within environments where limited but active land management including logging is allowed. Practices which could be considered include insect control, salvage logging, prescribed fire, and prescribed logging.

Appendix A: Glossary

Miscellaneous Old Forest: stands are biologically mature, but long term management goals and commitments are uncertain. Many forest stands beyond normal rotation age conform to this description, especially on non-industrial private lands.

Moraines: Ridges of sediment that accumulated along the margin of the glacier as the glacier stood in place for a long period of time.

Old Growth Reserve: stands are dominated by relatively old trees, which are older than their normal economic rotation age. The actual qualifying stand age will vary, depending on species (forest type) and site capability. The primary management goal is the long-term development and maintenance of old growth ecological attributes within a minimally manipulated environment. Active management is very limited. Some management and use practices that could be considered include: fire management, pest control, recreation and research.

Outwash plains: Are formed by meltwater rivers that flowed beyond the margin of the glacier and deposited sandy and gravelly sediment. When the ice melted, the sand and gravel collapsed to form an irregular surface that typically contains many closed depressions known as kettles.

Passive management: means the goals of the native community management area are achieved primarily without any direct action. Nature is allowed to determine the composition and structure of the area. For example, patches of large woody debris and the accompanying root boles (tip-up mounds) that are characteristic of old-growth structure are best achieved through natural processes. Passive management, however, does not mean a totally hands off approach. Some actions are required by law, such as wildfire suppression, consideration of actions when severe insect and disease outbreaks affects trees, and hazard management of trees along trails and roads. Other actions, such as removal of invasive exotics species, are necessary to maintain the ecological integrity of the site.

Relict Forests: are stands that appear to have never been manipulated or disturbed by humans of European descent. Some presettlement forest ecosystem conditions have been perpetuated. Ancient forest, a sub-category, is relict forest with the presence of some old, biologically mature trees. Very few relict forests still exist in Wisconsin.

Sustainable Forestry: The practice of managing dynamic forest ecosystems to provide ecological, economic, social, and cultural benefits for present and future generations.

Type 1 Recreational Use Setting: Objective of this setting is to provide a remote, wild area where the recreational user has opportunities to experience solitude, challenge, independence and self-reliance.

Type 2 Recreational Use Setting: Objective of this setting is to provide a remote or somewhat remote area with little development and a predominantly natural-appearing environment offering opportunities for solitude and primitive, non-motorized recreation.

Type 3 Recreational Use Setting: Objective of this setting is to provide readily accessible areas with modest recreational facilities offering opportunities at different times and places for a variety of dispersed recreational uses and experiences.

Type 4 Recreational Use Setting: Objective of this setting is to provide areas offering opportunities for intensive recreational use activities and expectations. Facilities when present, may provide a relatively high level of user comfort, convenience and environmental protection.

Appendix B: References

REFERENCES

Adams, C., K. Held, B. Isenring, D. Mladenoff, S. Moore, and E. Vlach. 1999. Wisconsin's Northern State Forest Assessments. Sustainable Forestry. Wisconsin Department of Natural Resources.

Alban, D.H. and D.A. Perala. 1990. Impact of aspen timber harvesting on soils. In, Sustained productivity of forest soils: 7 th North American forest soils conference, July 24-28, 1988, University of British Columbia, Vancouver, BC. Gessel, S.P., D.S. Lacate, G.F. Weetman, and R.F. Powers, Eds. Pp. 377-391.

Alban, D.H. and D.A. Perala. 1990. Ecosystem carbon following aspen harvest in the Upper Great Lakes. In R. D. Adams, Ed. Aspen symposium `89 proceedings, 1989 July 25-27, Duluth, MN. General Technical Report NC-140. St. Paul, MN: U.S. Dept. of Agriculture, Forest Service, North Central Forest Experiment Station Pp. 123-131

Alverson, W.S, D.M. Waller, and S.L. Solheim. 1988. Forests too deer: edge effects in northern Wisconsin. Conservation Biology, 2(4): 348-358.

Alverson, W.S., W. Kuhlmann, and D.M. Waller. 1994. Wild Forests: conservation biology and public policy. Washington, D.C.: Island Press.

Asplund, Timothy R. 1996. Impacts of Motor Boats on Water Quality in Wisconsin Lakes. Madison, WI: Wisconsin Department of Natural Resources. PUBL-RS-920-96.

Balgooyan, C.M. and D.M. Waller. 1995. The use of Clintonia borealis and other indicators to gauge impacts of white-tailed deer on plant communities in northern Wisconsin, USA. Natural Areas Journal 15(4): 308-318.

Bartelt, G., M. Beaufeaux, E. Epstein, and D. Zastrow. 1999. Regional Ecology. Wisconsin's Northern State Forest Assessments. Wisconsin Department of Natural Resources. PUB-FR-135 99.

Beals, E.W., G. Cottam, and R.S. Vogl. 1960. Influence of deer on vegetation of the Apostle Islands, Wisconsin. Journal of Wildlife Management, 24: 68-80.

Boelter, J.M. 1993. Soil Survey of Oneida County, Wisconsin. United States Department of Agriculture, Soil Conservation Service and Forest Service, in cooperation with the Research Division of the College of Agricultural and Life Sciences, University of Wisconsin.

Bogue, Margaret Beattie. Exploring Wisconsin's Waterways. Reprinted from the 1989-1990 Wisconsin Blue Book. p.4-29

Boone, T. Department of Natural Resources. June 2003. Personal Communication.

Brandt, M. Department of Natural Resources. 2003. Personal Communication.

Buller, Sheri. Naturalist on the NH-AL State Forest. Personal Communication, November 19, 2001.

Canham, C.D. and O. Loucks. 1984. Catastrophic windthrow in the presettlement forests of Wisconsin. Ecology, 65(3): 803-809.

Cleland, D.T. 2000. Historical and modern role of aspen in the Lake States. Presentation at an aspen management conference in Ironwood, MI, April 2000.

Cleland, D.T., P.E. Avers, W.H. McNab, M.E. Jensen, R.G. Bailey, T. King, and W.E. Russell. 1997. National hierarchical framework of ecological units. In, Ecosystem management: applications for sustainable forest and wildlife resources. Boyce, M.S. and A. Haney, Eds. New Haven and London: Yale University Press. Pp. 181-200.

Eckstein, R., R. Hoffman, J. Kovach, and D. Mladenoff. 2001. Community Restoration and Old Growth on the Northern Highland-American Legion State Forest. Wisconsin's Northern State Forest Assessments. Wisconsin Department of Natural Resources.

Egan-Bruhy, K.C. 2001. Archaeological Investigations at Trout Lake: Vilas County, Wisconsin. State Historical Society of Wisconsin, Historic Preservation Subgrant #55-00-15357-7.

Epstein, E., W. Smith, J. Dobberpuhl, and A. Galvin. 1999. Biotic Inventory of the Northern Highland-American Legion State Forest: A Baseline Inventory (1992-1996) in Preparation for State Forest Master Planning. Wisconsin's Natural Heritage Inventory Program. Wisconsin Department of Natural Resources.

Fannucchi, G., S. Gilchrist, L. Hannahs, J. Hoefler, R. Jurewicz, S. Klosiewski, and T. Stabo. 1998. Wisconsin's Northern State Forest Assessments. Environmental Education and Awareness. Wisconsin Department of Natural Resources.

Appendix B: References

Ficken, M.S., M.A. McLaren, and J.P. Hailman. 1996. Boreal Chickadee (*Parus hudsonicus).* In, The Birds of North America No. 254. A. Poole and F. Gill, eds. The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

Findlay, C.S. and J. Houlahan. 1997. Anthropological correlates of species richness in southeastern Ontario wetlands. Conservation Biology, 11(4): 1000-1009.

Finley, R.W. 1976. Original vegetation cover of Wisconsin, compiled from U.S. General Land Office notes. Madison, WI: University of Wisconsin Extension. Map (1:500,000).

Forman, R.T.T. and L.E. Alexander. 1998. Roads and their major ecological effects. Annual Review of Ecology and Systematics, 29: 207-231.

Forman, R.T.T. and M. Godrun. 1981. Patches and structural composition for a landscape ecology. Bioscience, 31: 733-40.

Frelich, L.E. and P.B. Reich. 1996. Old Growth in the Great Lakes Region. In, Eastern Old Growth Forests. Davis, M.B. Ed. Washington, D.C.: Island Press.

Garcia, E. and Carignan, R. 1999. Impact of wildfire and clear-cutting in the boreal forest on methylmercury in zooplankton. Can. J. Fish. Aquat. Sci. 56:339-345.

Gardner, Cynthia. of WDNR-NOR. 2002. Personal communication by D. Brusoe, 17 June, Madison, WI.

Great Lakes Indian Fish and Wildlife Commission. 1998. A Guide to Understanding Ojibwe Treaty Rights.

Green, J.C. 1995. Birds and forests: a management and conservation guide. St. Paul, MN: Minnesota Department of Natural Resources. 182 pp.

Groot, A. 1996. Regeneration and surface condition trends following forest harvesting on peatlands. NODN/NFP Tech Rep. TR-26. Sault Ste. Marie, ON: Natural Resources Canada, Can. For. Serv. 12 pp. + appendix.

Gross, D.A. and P.E. Lowther, 2001. Yellow-bellied Flycatcher (*Empidonax flaviventris).* In, The Birds of North America No. 566. A. Poole and F. Gill, eds. The Birds of North America, Inc., Philadelphia, PA.

Guthmiller, M., J. Cummings-Carlson, S. Seiger, and K. Engelien. 1998. Insects and Pathogens Affecting Forests on the Northern Highland-American Legion State Forest. Wisconsin Department of Natural Resources.

Hoffman, R. Department of Natural Resources – Endangered Resources. 2003. Personal Communication.

Hoffman, R. and K. Kearns, Eds. 1997. Wisconsin manual of control recommendations for ecologically invasive plants. Wisconsin Department of Natural Resources, Bureau of Endangered Resources. http://www.dnr.state.wi.us/org/land/er/invasive/manual_toc.htm

Howe, R.W. and M. Mossman. 1995. The significance of hemlock for breeding birds in the western Great Lakes region. Proceedings of a 1995 symposium on hemlock ecology and management, Iron Mountain, MI.

Johnson, C.E. 1995. Soil nitrogen status eight years after whole-tree clear-cutting. Canadian Journal of Forest Research, 25: 1346-1355.

Klase, W.M. 1998. Forest Land Ownership in Vilas and Oneida Counties, Wisconsin 1975-1994. MS Thesis: University of Wisconsin, Madison.

Lac du Flambeau Band of Lake Superior Chippewa Indians Webpage, http://www.glitc.org/ldf.htm

Lac du Flambeau Reservation Integrated Resource Management Plan. 1991-2001. Compiled by Gerald Walhovd, I&MP Forester, Great Lakes Agency.

Leatherberry, Earl C. 2001. Wisconsin private timberland owners: 1997. Res. Pap. NC-339. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station.

Leath, D. 2004. Personal communication.

Marcouiller, Dave and Terry Mace. 1999. Forests and Regional Development: Economic Impacts of Woodland Use for Recreation and Timber in Wisconsin. Report G3694. University of Wisconsin System, Cooperative Extension, Madison, WI.

Marcouiller, D., E. Olsen, J. Prey. 2002. State Parks and Their Gateway Communities, Developement and Recreation Planning Issues in Wisconsin.

Appendix B: References

Martin, Jeff A. 1989. Forestry Facts: What is a Cord? Department of Forestry, University of Wisconsin – Madison, Cooperative Extension, Madison, WI. No. 44.

Martin, M. 1995. Native herbaceous plants. In, Wisconsin deer population goals and harvest management environmental assessment. Madison, WI: Wisconsin Department of Natural Resources.

Martin, Karl and Scott Lutz. 2003. 2002 Annual Report on the Golden-winged Warbler Project in Northern Wisconsin. April 10, 2003.

Mason, Carol I. 1988. Introduction to Wisconsin Indians: Prehistory to Statehood. Sheffield, Salem, Wisconsin.

Mason, D.J. 1995. Changes in forest communities along aspen edges: the effect of aspen succession. M.S. thesis, University of Wisconsin, Madison, WI.

Milwaukee Journal Sentinel, April 2, 2000.

Mladenoff, D.J., T.A. Sickley, R.G. Haight, and A. P. Wydeven. 1995. A Regional Landscape Analysis and Prediction of Favorable Gray Wolf Habitat in the Northern Great Lakes Region. Conservation Biology, 9(2): 279-294.

Mossman, M., R. Eckstein, C. Doering, C. Ledin, P. Matthiae, B. Moss, K. Scheidegger, and D. Zastrow. 1997. Wisconsin's Northern State Forest Assessments. Biodiversity. Wisconsin Department of Natural Resources.

Mueller, G. 1980. Effects of recreational river traffic on nest defense by longear sunfish. Trans. Amer. Fish. Soc. 109(2):248-251.

Natzke, L. and D.J. Hvizdak. 1988. Soil Survey of Vilas County, Wisconsin.United States Department of Agriculture, Soil Conservation Service and Forest Service, in cooperation with the Research Division of the College of Agricultural and Life Sciences, University of Wisconsin.

North Temperate Lakes Long Term Ecological Research Webpage. http://lter.limnology.wisc.edu/

Oneida County Forestry. 1996-2005. Oneida County Comprehensive Land Use Plan.

Porvari, P., M. Verta, J. Munthe, and M. Haapanen. 2003. Forestry Practices Increase Mercury and Methyl Mercury Outputs from Boreal Forest Catchments. Environ. Sci. Technol. 37(11): 2389-2393.

Pritchett, W.L. 1979. Properties and Management of Forest Soils. New York, NY: John Wiley & Sons.

Rissman, A. and D. Daniels. 2002. *Northern Highland-American Legion State Forest Regional Analysis*. Wisconsin Department of Natural Resources. PUB-FR-186 2002.

Robbins, S.D. Jr. 1991. Wisconsin Birdlife: Population & Distribution Past & Present. Madison, WI: The University of Wisconsin Press. Pp.514-515

Rooney, T.P. 2003. Off-road vehicles as dispersal agents for exotic plant species in a forested landscape. Abstract to be presented at the State Natural Areas in September, 2003.

Schmidt, T.L. 1997. Wisconsin forest statistic, 1996. Res. Bul. NC-183. St. Paul, MN: USDA Forest Service, North Central Forest Experiment Station. 150 pp.

Schmidt, TL. 1998. Wisconsin Forest Statistics, 1996. North Central Forest Experiment Station. Forest Service. United States Department of Agriculture. Resource Bulletin, NC-183.

Schnaiberg, J., J. Riera, M.G. Turner, and P.R. Voss. 2002. Profile: Explaining Human Settlement Patterns in a Recreational Lake District: Vilas County, Wisconsin, USA. Environmental Management 30(1):24-34.

Stevens, Larry. Vilas County Forest Administrator. Personal Communication, March 20, 2002.

Stone, D.M. 2001. Sustaining Aspen Productivity in the Lake States. In, Sustaining Aspen in Western Landscapes: Symposium Proceedings, June 13-15, 2000, Grand Junction, CO. Shepperd, W. D., Binkley D., Bartos, D.L., Stohlgren, T.J., and Eskew, L.G. (comp.). Proceedings RMRS-P-18. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Pp. 47-59.

Stone, D.M. and J.D. Elioff. 1998. Soil properties and aspen development five years after compaction and forest floor removal. Canadian Journal of Soil Science, 78: 51-58.

Stone, D.M., J.A. Gates, and J.D. Elioff. 1999. Are we maintaining aspen productivity on sand soils? In, Proceedings, Improving Forest Productivity for Timber – A Key to Sustainability, December 1998, Duluth, MN. Zumbahlen, B. and A.R. Ek, (comp.). Department of Forest Resources, University of Minnesota, St. Paul, MN. Pp. 177- 184.

Appendix B: References

Timber Mart North Price Report. 1999-2001. Milwaukee, WI: George Banzhaf and Company. 6(1), 6(2), 7(1)

Trombulak, S.C. and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology, 14(1): 18-30.

US Census Bureau (USCB). 2001. Ranking Tables for Counties: 1990 and 2000. http://www.census.gov/.

USDA Forest Service. 1998a Chequamegon-Nicolet National Forest. Resource Assessment: Heritage Resources Executive Summary. http://www.fs.fed.us/r9/cnnf/natres/plan/res_assess/heritage_new.html

USDA Forest Service. 1998b Chequamegon-Nicolet National Forest. Resource Assessment: Special Forest Products Executive Summary. http://www.fs.fed.us/r9/cnnf/natres/plan/res_assess/heritage_new.html

USDA Forest Service. 1999 Chequamegon-Nicolet National Forest. Forest Plan Revision Draft Alternative Themes

USDA Forest Service. 2000. Analysis of the management situation for landscape pattern. Rhinelander, WI: Chequamegon-Nicolet National Forest. Unpublished.

USDA Forest Service. 2000. Analysis of the management situation for old growth. Rhinelander, WI: Chequamegon-Nicolet National Forest. Unpublished.

USDA Forest Service. 2000. Analysis of the management situation for special land allocation. Rhinelander, WI: Chequamegon-Nicolet National Forest. Unpublished.

USDA Forest Service. 2000. Analysis of the management situation for ecosystem restoration. Rhinelander, WI: Chequamegon-Nicolet National Forest. Unpublished.

USDA Forest Service. 2001. Analysis of the management situation for wilderness and semiprimitive nonmotorized areas. Rhinelander, WI: Chequamegon-Nicolet National Forest. Unpublished.

USDA Forest Service. 2002. Roads analysis Chequamegon-Nicolet National Forest. 97 pp. + appendices.

United States Department of Commerce. 2001. *Profiles of General Demographic Characteristics: 2000 Census of Population and Housing – Wisconsin*. www.census.gov/prod/cen2000/dp1/2kh55.pdf.

UWEX Cooperative Extension Service. 1980-1985. Wisconsin Forest Products Price Review. Boltwood Editions. University of Wisconsin-Extension.

Van Deelen, T.R. 1999. Deer-cedar interaction during a period of mild winters: implications for conservation of conifer swamp deeryards in the Great Lakes Region. Natural Areas Journal, 19: 263-274.

Verry, E.S. 1972. Effect of an aspen clearcutting on water yield and quality in northern Minnesota. In, Watersheds in Transition Symposium, Proc. Am. Water Resource Assoc., Urbana, Ill.

Vilas County Forestry, Recreation, and Land. 1996-2005. Vilas County Comprehensive Land Use Plan.

Waller, D.M., W.S. Alverson, S. Solheim. 1996. Local and regional factors influencing the regeneration of eastern hemlock. In, Hemlock Ecology and management. Mroz, G. and J. Martin, Eds. Iron Mountain, MI: Michigan Technological University. Pp. 73-90.

Watkins, T., D. Beard, R. Dunst, L. Hannahs, M. Mossman, D. Olson, J. Pohlman, and B.V. Zouwen. 1998. Wisconsin's Northern State Forest Assessments. Monitoring and Evaluation. Wisconsin Department of Natural Resources.

Watkins, T., P. Bruggink, L. Hannahs, E. Nelson, J. Pardee, and J. Petchenik. 2001. Recreational Supply and Demand. Wisconsin's Northern State Forest Assessments. Wisconsin Department of Natural Resources. PUB-FR-137.

Watkins, T., T. Mace, and D. Marcouiller. 1999. *Socioeconomics for the NH-AL State Forest Region*. Wisconsin's Northern State Forest Assessments. Wisconsin Department of Natural Resources. PUB-FR-138a 99.

Wilson, Fred G. History of State Forestry in Wisconsin: Exploration and Settlement. Unpublished document.

WISCLAND Land Cover Database of Wisconsin. 1998. Madison, WI: Wisconsin Department of Natural Resources.

Wisconsin Administrative Code 1810.1. Department of Natural Resources. Historic Preservation. http://www.legis.state.wi.us/rsb/code/

Appendix B: References

Wisconsin Administrative Code, Chapters NR44: Master Planning for Department Properties and NR 150: Environmental Analysis and Review Procedures for Department Actions http://www.legis.state.wi.us/rsb/code/

Wisconsin Breeding Bird Atlas Webpage. http://www.uwgb.edu/birds/wbba/

Wisconsin Conservation Department. 1950. *A Report on the Northern Highland & American Legion State Forests*. Wisconsin Conservation Department, Division of Forests and Parks. Madison, WI.

Wisconsin Conservation Department, Division of Forests and Parks. 1955. Wisconsin State Forests: A Report on Their Origin, Development, Public Usefulness, and Potentialities.

Wisconsin Department of Transportation. 2002. Rustic Road Program. http://www.dot.wisconsin.gov/travel/scenic/rustic-roads.htm

Wisconsin Department of Natural Resources. 1995. Wisconsin's Forestry Best Management Practices for Water Quality. Publication # FR093.

Wisconsin Department of Natural Resources. 1998. Northern Highland-American Legion State Forest. Progress Report #1. NH-AL Issues Opinionnaire.

Wisconsin Department of Natural Resources, Division of Forestry. 1998-2004. Northern Highland – American Legion State Forest. Progress Reports # 2-9, 11, 13-14.

Wisconsin Department of Natural Resources. 2002. Northern Highland-American Legion State Forest Alternatives for the Master Plan Revision. Progress Report #10.

Wisconsin Department of Natural Resources. 2003. Northern Highland-American Legion State Forest Preferred Alternative. Progress Report #12.

Wisconsin Department of Natural Resources. 1995. Turtle-Flambeau Scenic Waters Area: Master Plan and Environmental Assessment.

Wisconsin Department of Natural Resources. 1995. Northern initiatives – a strategic plan for the next decade. WDNR, Rhinelander, WI.

Wisconsin Department of Natural Resources. 1998. Wisconsin Recreation Statistics: Adult Participation in Selected Outdoor Activities, 1992-1997.

Wisconsin Department of Natural Resources. 1998. 1997 ATV survey. Prepared by the Bureau of Integrated Science Services on behalf of the Bureau of Forestry, Wisconsin Department of Natural Resources, Madison, WI. 18 pp. Draft.

Wisconsin Department of Natural Resources. 1998. Trail based recreation: statewide comprehensive outdoor recreation plan [2000-2005 preliminary data]. Wisconsin Department of Natural Resources, Madison, WI. Draft.

Wisconsin Department of Natural Resources. 1998-2001. NH-AL Master Planning Facts: Volume 1. Northern Highland-American Legion State Forest Master Plan.

Wisconsin Department of Natural Resources. 1999. *Wisconsin's Northern State Forest Assessments: Regional Ecology*. PUB-FR-135 99.

Wisconsin Department of Natural Resources. 1999. Public Land and Property Taxes. PUB-LF-001.

Wisconsin Department of Natural Resources. Undated. *Master Planning Facts*.

Wisconsin Department of Natural Resources. 1999. *Shaping the Future: Master Planning for the Northern Highland-American Legion State Forest*.

Wisconsin Department of Natural Resources. 1999. Wisconsin's forestry best management practices for water quality – the 1995-1997 BMP monitoring report. PUB-FR-145-99. Wisconsin Department of Natural Resources, Bureau of Forestry, Madison, WI.

Wisconsin Department of Natural Resources. 2001. *Wisconsin's Northern State Forest Assessments: Recreational Supply and Demand.* PUB-FR-137 2001.

Wisconsin Department of Natural Resources. 2001. Wisconsin's northern state forest assessments: community restoration and old growth on the Northern Highland-American Legion State Forest. PUB-FR-139b 2001. Wisconsin Department of Natural Resources, Madison, WI.

Wisconsin Department of Natural Resources. 2002. ATV trails database. Madison, WI. (Database under development by WDNR Division of Forestry and WDNR GIS Services Section.)

Appendix B: References

Wisconsin Department of Natural Resources. 2002. Silviculture and forest aesthetics handbook. Handbook 2431.5. Wisconsin Department of Natural Resources, Madison, WI.
www.dnr.state.wi.us/org/land/forestry/publications
Wisconsin State Statutes 66.04047, 23.22, .23.235
http://www.legis.state.wi.us/../rsb/stats.html

Wisconsin Department of Natural Resources Webpage: Mercury in the Environment
http://www.dnr.state.wi.us/org/caer/ce/mercury/

Wisconsin Department of Natural Resources Webpage: Spruce Grouse Factsheet
http://www.dnr.state.wi.us/org/land/er/factsheets/birds/Sprgro.htm

Wisconsin Department of Natural Resources Webpages: Wisconsin Listed Species
http://dnr.wi.gov/org/land/er/invasive

Wisconsin State Statutes Chapter 28: Public Forests
http://www.legis.state.wi.us/rsb/stats.html

Wisconsin Historical Society. Undated. *Northern Wisconsin: Trout Lake's History*. Wisconsin State Historical Society brochure.

Wisconsin Department of Natural Resources. Undated. *Master Planning Facts*.

Wydeven, A. 1995. Wolf carrying capacity. In, Wisconsin deer population goals and harvest management environmental assessment. Madison, WI: Wisconsin Department of Natural Resources.

Wydeven, A. 2003. Personal communication.

Wydeven, A.P., D.J. Mladenoff, T.A. Sickley, B.E. Kohn, R.P. Thiel, and J.L. Hansen. 2001. Road Density as a Factor in Habitat Selection by Wolves and Other Carnivores in the Great Lakes Region. Endangered Species UPDATE, 18(4): 110-114.

Wydeven, A.P. and J. E. Wiedenhoeft. 2002. Wisconsin Endangered Resources Report #121. Status of the Timber Wolf in Wisconsin. Performance Report 1 July 2001 through 30 June 2002. Wisconsin Department of Natural Resources.

Yousef, Y. A., W. M. McLellon, and H. H. Zebuth. 1980. Changes in phosphorus concentrations due to mixing by motor boats in shallow lakes. Water Research 14:841-852.

APPENDIX C: ECOLOGICAL ATTRIBUTES OF THE NORTHERN HIGHLAND-AMERICAN LEGION STATE FOREST

NH-AL Ecological Attributes

NH-AL ECOLOGICAL ATTRIBUTES	Forest Production	Habitat	Native Community Passive	Native Community Active	Recreation	Scenic	Wild Resources	Admin
Large Amounts Coarse Woody Debris	No	No	Yes	Most	Some	Some	Yes	Some
Large Amounts of Standing Dead	No	No	Yes	Most	Some	Some	Yes	Some
Diverse Fungal and Lichen Communities	Moderate	Low	High	Moderate	Moderate	Moderate	High	Low
Individual Tree Fall Gaps	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Diversity of Disturbance Patch Sizes that Cross Stand Boundaries	No	No	Yes	Yes	No	No	Yes	No
Catastrophic Fire Regenerates Stands	No	No	No	No	No	No	No	No
Disturbance Regeneration of Stands	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Disturbance Regeneration of Stands While Retaining Numerous Snags	No	No	No	Yes	No	No	No	No
Savanna and Barrens Attributes	No	No	No	Yes	No	No	No	No
Patches Missed by Disturbance Events that Develop Old-Growth	No	No	Yes	Yes	No	No	No	No
Large Tree Diameter	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Deep Furrowed and Plated Bark	Some	No	Yes	Most	Some	Some	Yes	Some
Tip-up Mounds	Yes	Few	Yes	Yes	Some	Some	Yes	Few

APPENDIX D: SPECIES OF SPECIAL CONCERN, WISCONSIN STATE THREATENED AND ENDANGERED SPECIES WITHIN THE NORTHERN HIGHLAND-AMERICAN LEGION STATE FOREST

Scientific Name	Common Name	Status	Last Observed	Group
Sorex palustris	Water Shrew	Special Concern	1946	Mammal
Accipiter gentiles	Northern Goshawk	Special Concern	1994	Bird
Ammodramus leconteii	Le Conte's Sparrow	Special Concern	1993	Bird
Anas rubripes	American Black Duck	Special Concern	1993	Bird
Ammodramus nelsoni	Sharp-tailed Sparrow	Special Concern	1993	Bird
Asio otus	Long-eared Owl	Special Concern	1988	Bird
Buteo lineatus	Red-shouldered Hawk	State Threatened	1975	Bird
Botaurus lentiginosus	American Bittern	Special Concern	1993	Bird
Carduelis pinus	Pine Siskin	Special Concern	1996	Bird
Catharus ustulatus	Swainson's Thrush	Special Concern	1994	Bird
Chlidonias niger	Black Tern	Special Concern	1992	Bird
Circus cyaneus	Northern Harrier	Special Concern	1994, 1993	Bird
Coturnicops noveboracensis	Yellow Rail	State Threatened	1988	Bird
Dendroica caerulescens	Black-throated Blue Warbler	Special Concern	1994	Bird
Dendroica Tigrina	Cape May Warbler	Special Concern	1993	Bird
Dendroica cerulea	Cerulean Warbler	State Threatened	1996	Bird
Empidonax flaviventris	Yellow-bellied Flycatcher	Special Concern	1996	Bird
Falcipennis Canadensis	Spruce Grouse	State Threatened	1993	Bird
Falco columbarius	Merlin	Special Concern	1969	Bird
Haliaeetus leucocephalus	Bald Eagle	Special Concern, Federally Threatened	1997	Bird
Pandion haliaetus	Osprey	State Threatened	1998	Bird
Perisoreus canadensis	Gray Jay	Special Concern	1994	Bird
Picoides arcticus	Black-backed Woodpecker	Special Concern	1994	Bird
Poecile hudsonica	Boreal Chickadee	Special Concern	1993	Bird
Oporornis agilis	Connecticut Warbler	Special Concern	1990	Bird
Coregonus artedi	Lake Herring	Special Concern	1979	Fish
Moxostoma valenciennesi	Greater Redhorse	State Threatened	1990	Fish
Notropis anogenus	Pugnose shiner	State Threatened	1990	Fish
Etheostoma microperca	Least darter	Special Concern	1985	Fish
Fundulus diaphranus	Banded Killifish	Special Concern	1985	Fish
Lepomis megalotis	Longear Sunfish	State Threatened	1983	Fish
Clemmys insculpta	Wood Turtle	State Threatened	1992	Amphibian
Hemidactylium scutatum	Four-toed Salamander	Special Concern	1996	Amphibian
Diadophis punctatus edwardsii	Northern ringneck snake	Special Concern	1996	Reptile
Rana catesbeiana	Bullfrog	Special Concern	1996	Reptile
Alasmidonta marginata	Elktoe	Special Concern	1996	Mussel
Pleurobema sintoxia	Round Pigtoe	Special Concern	1997	Mussel
Pyganodon cataracta	Eastern Floater	Special Concern	1990	Mussel
Aeshna eremite	Lake Darner	Special Concern	1991	Dragonfly
Aeshna tuberculifera	Black-tipped darner	Special Concern	1991	Dragonfly
Coenagrion interrogatum	Subarctic Bluet	Special Concern	1967	Dragonfly
Gomphurus lineatifrons	Splendid Clubtail	Special Concern	1994	Dragonfly
Gomphurus ventricusus	Skillet Clubtail	Special Concern	1997, 1992	Dragonfly
Ischnura hastata	Citrine Forktail	Special Concern	1962	Dragonfly
Nannothemis bella	Elfin Skimmer	Special Concern	1966	Dragonfly
Nasiaeschna pentacantha	Cyrano Darner	Special Concern	1994	Dragonfly
Somatochlora cingulata	Lake Emerald	Special Concern	1994	Dragonfly
Somatochlora elongata	Ski-tailed Emerald	Special Concern	1988	Dragonfly
Somatochlora forcipata	Forcipate Emerald	Special Concern	1964	Dragonfly
Somatochlora kennedyi	Kennedy's Emerald	Special Concern	1965	Dragonfly

Appendix D: Species of Special Concern & Threatened & Endangered

Scientific Name	Common Name	Status	Last Observed	Group
Stylurus scudderi	Zebra clubtail	Special Concern	1994	Dragonfly
Williamsonia fletcheri	Ebony Bog Hunder	Special Concern	1992	Dragonfly
Boloria frigga	Frigga Fritillary	Special Concern	1993	Butterfly
Boloria eunomia	Bog Fritillary	Special Concern	1993	Butterfly
Lycaena epixanthe	Bog Copper	Special Concern	1995	Butterfly
Banksiola dossuaria	A Giant Casemaker Caddisfly	Special Concern	1995	Caddisfly
Isoperla richardsoni	A Perlodid Stonefly	Special Concern	1994	Stonefly
Caenis youngi	A Small Square-gilled Mayfly	Special Concern	1994	Mayfly
Dubiraphia bivattata	A Dubiraphian Riffle Beetle	Special Concern	1994	Beetle
Dubiraphia robusta	Robust Dubiraphian Riffle Beetle	Special Concern	1994	Beetle
Lioporeus triangularis	A Predaceous Diving Beetle	Special Concern	1994	Beetle
Neoscutopterus hornii	A Predaceous Diving Beetle	Special Concern	1994	Beetle
Arethusa bulbosa	Swamp Pink	Special Concern	1996	Plant
Calypso bulbosa	Fairy Slipper	State Threatened	1992	Plant
Carex gynocrates	Northern Bog Sedge	Special Concern	1993	Plant
Carex pallescens var neogaea	Pale Sedge	Special Concern	1995	Plant
Carex vaginata	Sheathed Sedge	Special Concern	1993	Plant
Carex gynocrates	Northern Bog Sedge	Special Concern	1992	Plant
Carex lenticularis	Shore Sedge	State Threatened	1996	Plant
Carex tenuiflora	Sparse-flowered sedge	Special Concern	1993	Plant
Cirsium flodmanii	Flodman Thistle	Special Concern	1958	Plant
Clematis occidentalis	Purple Clematis	Special Concern	1975	Plant
Ceratophyllum echinatum	Prickly Hornwark	Special Concern	1996	Plant
Goodyera oblongifolia	Giant Rattlesnake-plantain	Special Concern	1996	Plant
Eleocharis olivacea	Capitate Spikerush	Special Concern	1929	Plant
Epilobium palustre	Marsh Willow-herb	Special Concern	1996	Plant
Equisetum variegatum	Variegated Horsetail	Special Concern	1993	Plant
Juncus stygius	Moor Rush	State Endangered	1997	Plant
Littorella Americana	American Shore-grass	Special Concern	1995	Plant
Myriophyllum farwellii	Farwell's Water-milfoil	Special Concern	1993	Plant
Osmorhiza chilensis	Chilean Sweet Cicely	Special Concern	1993	Plant
Ophioglossum pusillum	Adder's-tongue	Special Concern	1995	Plant
Platanthera dilatata	Leafy White Orchis	Special Concern	1995	Plant
Platanthera hookeri	Hooker Orchid	Special Concern	1893	Plant
Plantanthera orbiculata	Large Roundleaf Orchid	Special Concern	1993	Plant
Potamogeton confervoides	Algae-like Pondweed	State Threatened	1994	Plant
Potamogeton diversifolius	Water-thread Pondweed	Special Concern	1995	Plant
Potamogeton vaseyi	Vasey's pondweed	Special Concern	1996	Plant
Ribes hudsonianum	Northern Black Currant	Special Concern	1996, 1961	Plant
Triglochin maritime	Common Bog Arrow-grass	Special Concern	1936	Plant
Utricularia purpurea	Purple Bladderwart	Special Concern	2001	Plant
Utricularia pesupinata	Northeastern Bladderwort	Special Concern	1996	Plant
Utricularia geminiscapa	Hidden-fruited Bladderwart	Special Concern	1994	Plant

Appendix E: State Natural Areas (SNAs)

STATE NATURAL AREAS

NH-AL MASTER PLAN DESIGNATION PROCESS FOR STATE NATURAL AREAS

Generally, natural areas are tracts of land or water harboring natural features that have escaped most human disturbance and that represent the diversity of Wisconsin's native landscape. They contain outstanding examples of native biotic communities and are often the last refuges in the state for rare and endangered plant and animal species. State Natural Areas may also contain exceptional geological or archaeological features. The finest of the state's natural areas are formally designated as State Natural Areas. The Wisconsin State Natural Areas Program oversees the establishment of SNAs and is advised by the Natural Areas Preservation Council. The stated goal of the program is to locate, establish, and preserve a system of SNAs that as nearly as possible represents the wealth and variety of Wisconsin's native landscape for education, research, and to secure the long-term protection of Wisconsin's biological diversity for future generations. SNAs are unique in state government's land protection efforts, because they can serve as stand alone properties or they can be designated on other properties, such as a State Forest. By designating SNAs within the boundary of the NH-AL State Forest, we are helping to accomplish two different, legislatively mandated Department goals. This arrangement makes abundant fiscal sense because the state does not have to seek out willing sellers of private lands to meet the goals of multiple Department programs. This avoids duplicating appraisal and negotiation work and provides dual use of land that is already in public ownership

The process to establish a SNA begins with the evaluation of a site identified through field inventories conducted by DNR ecologists including the Biotic Inventory and Regional Analysis and the CROG (Community Restoration and Old Growth) Assessment. Assessments take into account a site's overall quality and diversity, extent of past disturbance, long-term viability, context within the greater landscape, and rarity of features on local and global scales. Sites are considered for potential SNA designation in one or more of the following categories:

Outstanding natural community
Critical habitat for rare species
Ecological reference (benchmark) area
Significant geological or archaeological feature
Exceptional site for natural area research and education.

DESIGNATION PROCESS OF SNAS AND NH-AL MASTER PLAN DEVELOPMENT

STEP 1: ASSESSMENTS

STEP 2: PREFERRED ALTERNATIVE

STEP 3: PROPOSED MASTER PLAN

Biotic Inventory and
Community
Restoration
Old Growth
(CROG)
The highest rated biotic sites and those with potential for old growth characteristics become "focus sites"
Native community sites
Recreation Areas
Wild resource Areas
Administrative Areas

Step 1: Results from both the Community Restoration Old Growth (CROG) Assessment and the Biotic Inventory, which were conducted on the Northern Highland-American Legion State Forest within the last five years, were used to decide which areas would become focus sites with specific management prescriptions. The CROG Assessment is one of a series of assessments sponsored by the WDNR's Division of Forestry to comply with Chapter 28.04 of the Wisconsin State Statutes. The CROG report included a detailed inventory of forest stands and ages on the NH-AL. The CROG then used this inventory as a base and developed criteria to identify, rank, and map the community restoration and old growth potentials and opportunities on the NH-AL.

The data gathered for the Biotic Inventory identifies and evaluates the natural communities, significant plant and animal populations, and selected aquatic features and their associated biotic communities. This report emphasized important protection, management, and restoration opportunities, focusing on both unique and representative natural features of the NH-AL property and surrounding landscape. The master plan process proposed the sites for alternative management and informed the public that after the goals of the state forest were met, then many of these sites would also be considered as State Natural Areas in the Proposed Master Plan.

Step 2: Using both the Biotic Inventory and CROG Reports, the NH-AL Preferred Alternative took sites ranked high to moderate, or having a good potential for old growth management or other unique biological resources and created focus sites.

Step 3: After public review of the preferred alternative, these focus sites were then designated Native Community Management Areas, Wild Resources Areas, Recreation Areas, or Administrative Areas in the Draft Master Plan. The expanded team evaluated each native community site, wild resources area, recreation area, or administrative area for the attributes and management necessary to sustain it well into the future. After the management goals were developed, the team reassessed the boundaries to assure that each forest stand was in the correct management area. Experts worked together to ensure that these sites were also given consideration as potential State Natural Areas.

Step 4: The last step in the process involved the SNA program staff in the Bureau of Endangered Resources, the staff on the NH-AL and the Expanded NH-AL master plan team which incorporates experts from many different programs. After the SNA ecologists developed the list of SNA opportunities it was given to the expanded team to evaluate. The sites were compared the ecological gap analysis of the SNA system. Then, the sites were compared to the previously agreed management and recreation proposals for the site. Thus, if the plant and animal species that made up the site were good representatives of a native community, filled a gap in the SNA system, and the intended management and recreation for the native community did not conflict, it was considered a good candidate.

Once approved by the Natural Resources Board, sites are formally "designated" as SNAs and become part of the Wisconsin State Natural Areas system. Designation confers a significant level of recognition of these sites natural values through state statutes, administrative rules, and guidelines

IMPACT TO MASTER PLAN PROCESS

The process for selecting and designating SNAs is determined by cooperative efforts between two programs within the DNR: The Division of Forestry and the Bureau of Endangered Resources. The master planning process for State Forests requires that the goals set by the Division of Forestry be considered before the Bureau of Endangered Resources submits candidate sites for SNA designation. This is done so that all sites are evaluated for timber production, which is outlined as a Division of Forestry priority. As a result SNAs are considered overlays to Land Management Areas. The same piece of land can achieve the goals of two different Department programs. Management activities for each proposed SNA reflect the general management prescriptions proposed for the area in which the SNA is located. For example, an SNA located within an area managed for hemlock hardwoods, will follow the hemlock hardwoods management objective, rather than a separate SNA management plan. The exact same timber management would occur with or without SNA Designation.

LAND MANAGEMENT IMPACT BY NATIVE COMMUNITY MANAGEMENT AREAS AND DESIGNATION OF SNAS

Native Community Management Areas emphasize aspects of the ecosystem that provide the full range of forest types and age classes as promoted by the property goals. *Hemlock hardwood and northern hardwood forest* are comprised of relict old-growth stands and mature forest that can develop into old-growth relatively soon. *Mixed Forest* are comprised of various pine and hardwood species mixed with aspen and white birch with some these forests being actively managed for old forest characteristics and others allowing natural processes to determine the old-growth characteristics. Most *pine forests* are actively managed at some point to regenerate the composition, but many stands become very old before this activity occurs. The *Johnson Lake Barrens* would be actively managed for an open landscape with scattered trees and groves. *Peatlands/Wetlands* areas would be primarily managed by permitting natural processes to determine the succession and structure of the area. And finally, *Special aquatic areas* would be recognized for their diverse flora and fauna with species populations maintained. Most of the time State Natural Areas are a subset of the Native Community Areas, and often times provide an ecological reference for making adaptive management decision on the rest of the native community area. Sometimes the SNA boundaries and the native community boundaries will be the same.

SNA MANAGEMENT ACTIVITIES

State Natural Areas are not exclusively passive management. Within the past five years, over 200 SNAs all over Wisconsin have had some type of active management. Examples of management activities include exotic species removal, burning and fuel reduction, brushing, trail development, ditch filling and planting. Timber harvesting is not a primary focus of an SNA, but it is often necessary to achieve the desired ecological goals of a specific habitat. During the same five years, 19 commercial timber operations were conducted on SNAs to achieve the ecological goals of the site. Regardless of any designation, wildfires on state forests would be actively suppressed, safety measures would occur in developed areas and insect and disease outbreaks would be considered for control.

RECREATIONAL IMPACTS

Impacts would be minimal because the recreation opportunities for any given area were determined before consideration as an SNA. State Natural Areas are not appropriate for intensive recreation and such areas were automatically ruled out as potential sites. However, SNAs can accommodate low-impact activities such as hiking, bird watching, and nature study. Examples of existing facilities with in proposed SNA

sites include remote and canoe campsites (limited facilities), hiking and cross-country ski trails, boat landings and ramps, snowmobile trails, and a paved bike trail. Most areas have walk-in or water access only. To comply with the SNA designation, existing trails may need to be rerouted to better protect sensitive areas, for safety reasons, for fire control access, or if it enters into a wetland area. Disabled access would be accommodated at sites with existing trails and roads.

BENEFITS FOR A PARTNERSHIP BETWEEN STATE FORESTS AND THE STATE NATURAL AREAS PROGRAM

The SNA program has standardized methods for conducting long-term monitoring of ecosystems and also has a network with a broad range of researchers, from aquatic biologists and botanists to zoologists, that can be encouraged to conduct research on the state forest to enhance our understanding of the NH-AL ecosystem. The experts in the Division of Forestry have experience in monitoring the trees and other plants, while SNA ecologists have expertise in monitoring aquatic flora and fauna, terrestrial invertebrates, fungi and lichens, ground layer plants, mammals, reptiles and amphibians, and birds. Together an exceptional collaborative monitoring program could be developed.

The SNA program can bring a broad range of educators together to assist in understanding and interpreting the ecology of the NH-AL.

The SNA Program can lend its expertise to help create ecological interpretive signs and trail guides for better understanding of the full range of biological diversity on the NH-AL.

The SNA Program can assist in conducting land management activities such as invasive exotic species control, brushing and conducting prescribed burns.

The Division of Forestry would not lose any of its management or decision-making authority, but gain the ability to provide a broader range of opportunities that would help fill its mission by collaborating with the SNA Program.

An outside forest certification audit of the State Forest Program concluded that cooperation between the Division of Forestry and the State Natural Areas Program was commendable. This cooperation should continue to maintain such a high rating by future auditors.

With a joint consideration, the same piece of land can achieve the goals of two different programs. If there were a lack of teamwork, the SNA Program would still pursue sites to fulfill its goals. Such a venture could duplicate an additional 21,000 acres of land with a cost of $50,000,000 or more to the state of Wisconsin. Cooperation makes abundant fiscal sense.

PROPOSED STATE NATURAL AREAS

This is a list of proposed SNA sites on the NH-AL. Each of these sites either contain part of, or the entire boundary of a Native Community Area, Wild Resources Area, or Recreation Area. The number correlates to the site number on the Proposed SNA Sites map found in the appendix.

#1 Catherine Lake Hemlock-Hardwoods:
This site contains a relict old-growth stand of hemlock and yellow birch that are over 250-years old. The site would be managed as a Hemlock/Northern Hardwood Native Community Management Area. The older and least disturbed portions of the site encompassing 827-acres including 33 acres of water would be passively managed and designated the Catherine Lake Hemlock-Hardwoods SNA. The remainder of the site would be managed to promote the old-growth character of the site and look for opportunities to manage for a forest dominated by large trees and diverse forest structure.

CROG: 5A, 6A, 17AB
Biotic Inventory: 1
Draft Master Plan Area: 9
Native Community: Hemlock Hardwoods

#2 DuPage Lake Peatlands:
This site contains a large complex of wetland communities with patches of old-growth hemlock and white pine forest. The site (3,205 acres, including 230 acres of water) would be managed as a Peatland/Wetland Native Community Management Area. The vast peatlands, stunted spruce, old-growth relict forest and inaccessible nature of the site lends itself to passive management. Most of the areas south of J and a connecting strip to an ancient forest relict south of Cedar Lake Road would be managed passively and constitute the DuPage Lake Peatlands SNA. The remainder of the site would be actively managed for old-growth hemlock, northern hardwood, and white pine characteristics.

Biotic Inventory: 2, 3
CROG: 18AB
Draft Master Plan Area:10
Native Community: Peatland Wetland (01)

#3 Toy Lake Swamp:
This site contains a large wetland complex of hardwood swamp, white cedar swamp, and alder thicket. Within this swamp (2,301 acres, including 124 acres of water) are islands of mature spruce/fir and hemlock/hardwoods. The site would be managed as a Peatland/Wetland Native Community Management Area. Most of the area would be passively

managed, with boundary areas and accessible aspen and hardwoods open for active management. The passive management zone would also be designated Toy Lake Swamp SNA.

Biotic Inventory: 8
Draft Master Plan Area: 10
Native Community: Peatland Wetland

#4 Frog Lake and Pines:
This existing 192-acre site is in the current Manitowish River Wilderness Area and the proposed Manitowish River Wild Resources Area. The existing SNA would be expanded to 1,176 acres, including 72 acres of water and cover the largest and oldest stands of pine. Because it is a wild resources area, all management will be passive.

Biotic Inventory: 5
CROG: 1A
Draft Master Plan Area: 17
Native Community: Manitowish River Wild Resource Area

#5 Papoose Creek Pines:
This 533-acre site would be managed as a Red Pine and White Pine Native Community Management Area. A combination of many active management techniques would be used to achieve the goals of an old-growth red pine/white pine forest. The western portion now mostly in plantation pine would be managed through timber harvest to mimic the structure of a naturally regenerated pine forest. The eastern and southern portions, which are mostly natural origin pines would be managed with a combination of thinning, removal of late succession competitors and an active fire research program. Natural origin pine forests in the Lakes States are considered to be a feature of high conservation value. This actively managed area would also be included as Papoose Creek Pines SNA to research the effects of fire on the ecosystem and to provide a comparative ecological reference for the adjacent are management by timber harvest alone.

CROG: 10AB
Biotic Inventory: 9
Draft Master Plan Area11
Native Community: Red and White Pine

#6 Rice Creek:
This 373 acre site features a large, diverse conifer swamp of white cedar, open bog, muskeg, upland hemlock stands, boreal rich fens, and Rice Creek. The site would be managed as a Peatland/Wetland Native Community Management Area. The passive management zone has been reduced to focus on the features of concern. The white cedar, boreal rich fens, old-growth relict hemlock stands, Keego Lake and Rice Creek (22 acres) itself would be passively managed, the remainder would see active management to promote maintenance of the cover types while extending their rotation towards biological maximums. The passively managed area encompassing 435-acres would also be designated the Rice Creek SNA.

Biotic Inventory: 10
Draft Master Plan Area: 10
Native Community: Peatland Wetland (03)

#7 Day Lake:
The existing 209-acre SNA would remain and also continue to be managed as a Special Aquatic Management Area. The 400-foot no cut buffer, which is currently part of the SNA, would now be actively managed zone (99 acres) to promote long-lived tree species, such as white pine, while maintaining water quality by utilizing Best Management Practices for Water Quality (BMPs).

Draft Master Plan Area: 13
Native Community: Special Aquatic

#8 Trout River:
This 108-acre site features a slow, warm, hard water stream providing habitat for several rare species. The site would be passively managed below the high water mark as a Special Aquatic Native Community Management Area and also designated Trout River SNA. This is a special aquatic site that was not listed in the preferred alternative but added later in master plan team discussions.

Draft Master Plan Area: 12
Native Community: Special Aquatic

#9 Camp Lake and Pines:
The site features an ultrasoft water Camp Lake (65 acres), a small unnamed lake and the surrounding upland white and red pines. The site is a red and white pine Native Community Management Area with emphasis on allowing natural processes to predominate around the lake and more active management in the eastern portion of the area. An active fisheries research project in progress, which is testing the effects of adding woody debris to the lake. The 146-acre core is managed to passively allow natural processes to determine the structure of the uplands. The site would also be designated the Camp Lake and Pines SNA.

Biotic Inventory: 44
Draft Master Plan Area: 11
Native Community: Red & White Pine

 # 10 Devine Lake and Mishonagon Creek:
This 1,041-acre site would be managed as a Special Aquatic area and also as a wilderness lake. The boundary was reduced from that presented in the preferred alternative to one narrowly focused on the features of concern, the hard water springs,

spring lake, cold water stream and the surrounding forested wetlands. The entire site would also be designated Devine Lake and Mishonagon Creek SNA to further recognize the unique attributes of the aquatic and wetland communities.

Biotic Inventory: 45
Draft Master Plan Area: 13
Native Community: Special Aquatic

#11 Black Tern Bog:
This existing 15-acre SNA would continue to be an SNA and be managed as a Special Aquatic Management Area. The uplands around the bog would not be included the SNA and would now be part of the Forest Production Area. BMPs would be utilized to assure water quality.

Draft Master Plan Area: 13
Native Community: Special Aquatic

#12 Trout Lake Conifer Swamp:
This existing 22-acre SNA is located at the south end of Trout Lake and would continue its designation under the proposed master plan. The area is managed as a Peatland Wetland Native Community Area.

#13 Allequash Lake and Pines:
This site would be managed as a Mixed Forest Native Community Management Area. The objective of this area would be old-growth characteristics and maintenance of closed canopy white pine and red oak forest. Most of the area would be actively managed to attain and enhance old oak and pine characteristics. The passive management zone focuses on the oldest white pine and the near shore habitat around the southwest arm of Allequash Lake. The passively managed area encompassing 265 acres of upland and the 133 acre southwest arm of Allequash Lake would also become the Allequash Lake SNA

CROG: 15AB
Biotic Inventory: 34
Draft Master Plan Area: 12
Native Community: Mixed Forest

#14 Lost Canoe:
This site contains a variety of old-growth sites and ranges from a mesic hemlock forest in the east to a dry red pine forest in the west which is a classic continuum of plant communities. The center of the site would be passively managed just as it is now, and the surrounding acres would receive more active management. The center portion going from the existing Escanaba Hemlocks State Natural Area through the isthmus between Lost Canoe and Escanaba, the entire shore of Pallette Lake and the Stevenson Springs are would be a passively managed zone and also be Lost Canoe SNA. The site, which encompasses 1,136 acres including 269 acres of water, would make an excellent place to study the dynamics of different forest types across a relative small area.

CROG: 13AB
Biotic Inventory: 31, 32, 33
Draft Master Plan Area: 12
Native Community: Mixed Forest

#15 Nixon Lake:
This 737-acre site features a shallow, soft water drainage lake (137 acre) and an extensive sedge meadow. The site would be managed as a Special Aquatic Native Community Management Area and also designated Nixon Lake SNA. This is a special aquatic site that was not listed in the preferred alternative but added later in master plan team discussions.

Draft Master Plan Area: 13
Native Community: Special Aquatic

#16 Johnson Lake Barrens and Springs:
This existing 198-acre barrens SNA would be managed using prescribed fire and brushing as the primary management techniques. This native community management area along with the 327-acre **(A) Garland Springs, Salsich Springs**, and the existing **(B) Goodyear Springs-East** State Natural Areas would be combined to create a Johnson Lake Barrens and Springs State Natural Area encompassing 1,077 acres. The uplands would be actively managed for the perpetuation of bracken grasslands. The soft water streams and soft water springs would be passively managed. Both uplands and wetlands would provide an ecological reference area to compare with other bracken grassland and stream management. The boundary of Goodyear Springs East was modified to more precisely feature the springs and adjoining wetlands, and the Siphon Springs portion of the natural area was removed and is now in forest production area.

Johnson Lake Barrens & Springs:
Biotic Inventory: 18
Draft Master Plan Area: 14
Native Community: Johnson Lake Barrens

Goodyear Springs:
Draft Master Plan Area 13
Native Community: Special Aquatic

Garland Salsich:
Draft Master Plan Area 13
Native Community: Special Aquatic

#17 Lake Alva Birch-Hemlock:
This site contains a relict old-growth stand of yellow birch and hemlock that are over 250-years old. The site would be managed as an ecological reference area in the Lake Laura Loamy Hills Native Community Management Area. The older

and least disturbed portions of the site encompassing 314-acres including 26 acres of water would be passively managed and also designated the Lake Alva Birch-Hemlock SNA. The remainder of the site would be managed to promote the old-growth character of the site and look for opportunities to manage for a forest dominated by large trees and diverse forest structure.

Biotic Inventory: 22
CROG: 4A
Draft Master Plan Area: 8
Native Community: Lake Laura Loamy Hills

#18 Lake Laura Hardwoods:
This site contains a relict old-growth stand of hemlock and northern hardwoods that are over 250-years old. The site would be managed as an ecological reference area in the Lake Laura Loamy Hills Native Community Management Area. The older and least disturbed portions of the site encompassing 852-acres including Salsich Lake (60 acres) would be passively managed and also designated the Lake Laura Hardwoods SNA. The remainder of the site would be managed to promote the old-growth character of the site and look for opportunities to manage for a forest dominated by large trees and diverse forest structure.

Biotic Inventory: 23
CROG: 2A
Draft Master Plan Area: 8
Native Community: Lake Laura Loamy Hills

#19 Aurora Lake:
This site combines portions of the existing Aurora Lake SNA, currently 250 acres, with Frank Lake and the Mary Davis Reis Bog. Because these areas are contiguous, it has been proposed that they be combined. The site would be managed as a Peatland/Wetland Native Community Management Area. The site would be managed passively in the wetlands and actively in the frost packet to keep it open. The boundary was significantly reduced to focus the management on the native communities of interest. Most of the upland forest would be actively managed for timber production area. The entire revised boundary of 834 acres including 301 acres would also be the Aurora Lake SNA.

Biotic Inventory: 26, 27, 28
Draft Master Plan Area: 8
Native Community: Peatland Wetland

#20 Plum Lake Hemlocks:
This site, currently 665 acres, contains a relict old-growth stand of hemlock that are over 250-years old. The site would be managed as an ecological reference area in the Lake Laura Loamy Hills Native Community Management Area. The older and least disturbed portions of the site encompassing 744-acres would be passively managed and also designated the Plum Lake Hemlocks SNA.

Biotic Inventory: 24
CROG: 3A
Draft Master Plan Area: 8
Native Community: Lake Laura Loamy Hills

#21 Bittersweet Lakes:
This site contains 180 to 220-year old red and white pine, 270-year old relict hemlock forest and mature northern hardwoods. The site contains the existing 568-acre Bittersweet Lakes SNA, and would now be managed as the Bittersweet Recreation Area featuring non-motorized recreation opportunities. The land management would maintain the old-growth forest primarily through passive management techniques. The relict old-growth forest of hemlock, white and red pine along with the existing SNA would be combined to form an expanded Bittersweet Lakes SNA encompassing 1,136 acres, including 288 water acres. The site would provide an unparalleled opportunity for research, education, and low intensity recreation among the oldest trees on the state forest.

Biotic Inventory: 38
CROG: 16AB
Draft Master Plan Area: 21
Bittersweet Non-motor Recreation Area

#22 Tomahawk Lake Hemlocks:
This 266-acres old-growth hemlock relict would be managed as a Hemlock/Northern Hardwoods Native Community Management Area using passive techniques. The entire site would also be designated the Tomahawk Lake Hemlocks SNA.

Biotic Inventory: 54
CROG: 33B
Draft Master Plan Area: 9
Native Community: Hemlock Hardwoods

Appendix E: State Natural Areas (SNAs)

#23 Two Lakes Oak-Pine Forest:
This site contains a mixed forest of mature red pine, white pine, and red oak. A windstorm leveled a portion of the site in 1999, and an integrated team determined that no salvage would take place and research plots would be established. The site would be managed as a Mixed Forest Native Community Management Area. The site was reduced in size to accommodate the legal access of adjacent landowners, The 112-acre no salvage area in the center would also become the Two Lakes Oak-Pine Forest SNA and the remainder of the site would be actively managed to promote old forest characteristics.

Biotic Inventory: 56
CROG: 30B
Draft Master Plan Area: 13
Native Community: Mixed Forest

#24 Wind Pudding Lake:
The proposed 340-acre site includes the existing 159-acre eastern basin of Wind Pudding Lake SNA, which currently has a no harvest buffer of 400-feet around the lake. The proposed management would have Wind Pudding Lake as a Special Aquatic Management Area and also an SNA. The uplands in the 181 acre buffer would be part of the SNA, and have active timber management to promote long-lived tree species, especially white pine, while assuring water quality by utilizing BMPs for Water Quality.

Biotic Inventory: 57
Draft Master Plan Area: 13
Native Community: Special Aquatic

#25 Big Swamp:
This site contains a vast peatland and upland sandy patches around the edge. The site would also be combined with site **A (Swanson Lake)**, because they share the same wetlands. The size of the site has been reduced to more closely follow the wetland boundary on the east side. The Swanson Lake and Pines site is mostly wetland and the uplands would be managed as red pine/white native community. The remainder of the site would be managed as a Peatland/Wetland Native Community Management Area. The peatland of stunted spruce, cedar swamp and sedge meadow would be passively managed. About 32 acres of red and white pine would be actively managed through timber thinning and prescribed burning to achieve ecological goals. This 2,934-acre zone including 115 acres of water would also be designated Big Swamp SNA. The remainder of the Native Community Management Area would be managed through active timber management to achieve ecological goals.

Big Swamp
Biotic Inventory: 61
Draft Master Plan Area: 10
Native Community: Peatland Wetland

Swanson Lake
Biotic Inventory: 62
CROG: 32B
Draft Master Plan Area: 11
Native Community: Red & White Pine

#26 Rainbow Wetlands:
This site contains a large wetland complex covering 2,323 acres, including small islands of sand soils supporting pines and hardwoods. The area has been recently impacted by wind events that leveled most of the larger trees with accessible areas being salvaged. The site would be managed as a Peatland/Wetland Native Community Area. The boundary has been slightly reduced from that appearing in the preferred alternative. These wetlands would be passively managed and also designated the Rainbow Wetlands SNA.

Biotic Inventory: 60
Draft Master Plan Area: 10
Native Community: Peatland Wetland (06)

#27 Stone Lake Pines:
This proposed 199-acre addition to the original 65 acre SNA would contain a string of small islands in a wetland supporting 130-year old red pines. The site would continue to be passively managed as a Red Pine/White Pine Native Community Management Area and also be designated the Stone Lake Pines SNA.

Biotic Inventory: 65
Draft Master Plan Area: 11
Native Community: Red & White Pine

#28 Shallow Lake:
This 103-acre site features a shallow, soft, seepage lake (28 acres), providing habitat for several rare plant species. The lake and adjacent wetlands would be passively managed as a Special Aquatic Native Community Management Area and also designated Shallow Lake SNA. This is a special aquatic site that was not listed in the preferred alternative but added later in master plan team discussions.

Biotic Inventory: 64
Draft Master Plan Area: 13
Native Community: Special Aquatic

#29 High Lake Spruce Fir Forest:
This 40-acre site was established as a SNA in the early 1950's to recognize a forty acre stand of boreal forest. At that time, no other stands were known in the state. Since then, the spruce and fir component of the stand has been lost and the site no longer contains ecological criteria for which it was established. This stand will now be managed as a forest production area.

NATURAL RESOURCES USED BY LOCAL NATIVE AMERICAN TRIBES

The Ojibwe[1] had long lived in the Lake Superior region (portions of modern-day Minnesota, Wisconsin, Michigan, and Canada) by the time European explorers first entered the area. At that time, the Ojibwe lived a semi-nomadic lifestyle, moving seasonally from camp to camp, harvesting from the earth (aki[2]) vital foods, medicines, utility supplies, and ceremonial items.

As more Europeans moved into the Lake Superior region in search of timber and minerals, the United States government obtained vast parcels of land from the Ojibwe through cession treaties. In many of these treaties, the Ojibwe retained the rights to hunt, fish, and gather in the ceded territories to meet economic, cultural, spiritual, and medicinal needs — in essence, to sustain their lifeway. Tribal negotiations for these rights were fastidious and purposeful, and only through the guarantee of these rights, did the tribes agree to sign the treaties. Today, these reserved usufructory rights are often referred to as treaty rights.

Treaties that reserved these rights include the Treaty of 1836, ceding land in Michigan's Upper and Lower Peninsulas and parts of the Upper Great Lakes; the Treaty of 1837, ceding land in north central Wisconsin and east central Minnesota; the Treaty of 1842 ceding land in northern Michigan and Wisconsin and the western part of Lake Superior; and the Treaty of 1854, ceding land in northeastern Minnesota and creating reservations for many Ojibwe tribes.

For many years following the ratification of these treaties, the Ojibwe continued to hunt, fish, and gather as always. However, over the years, as states passed various conservation laws, state game wardens enforced these laws against tribal members. Members exercising their treaty rights off-reservation within the ceded territories were frequently cited and convicted in state courts. Many members paid fines, endured the confiscation of their rifles and fishing gear, and suffered incarceration.

Though the Ojibwe have always believed in the continued existence of their treaty rights, it was not until the 1970's, as part of a general resurgence of tribal self-determination, that Ojibwe governments and their members more aggressively and more formally challenged state conservation laws and enforcement activities. These challenges gave rise to many federal and state court decisions which reaffirmed Ojibwe off-reservation treaty rights on public lands in the ceded territories[3].

The courts confirmed the Ojibwe's understanding of their treaty rights: The treaties provide a "permanent" guarantee "to make a moderate living off the land and from the waters … by engaging in hunting, fishing and gathering as they had in the past."[4] In essence, the courts found the Ojibwe treaties to be legally binding agreements to be respected within the framework of the United States Constitution, which defines treaties as the "supreme law of the land."

In addition, the courts recognized that by reserving the rights to engage in hunting, fishing, and gathering, the Ojibwe also retained their sovereignty to regulate tribal members exer-

Appendix F: Natural Resources Used by Local Native American Tribes

cising these treaty rights. Sovereignty refers to the right of inherent self-government and self-determination. Thus, tribal self-regulation is a requisite of treaty rights implementation.

As the courts reaffirmed the Ojibwe's ceded territory treaty rights, a number of tribes[5] in Michigan, Minnesota and Wisconsin chose to enhance their self-regulatory infrastructures through the formation of the Great Lakes Indian Fish and Wildlife Commission (GLIFWC)…[GLIFWC] assists its member tribes with issues such as the application of tribal self-regulation within the off-reservation ceded territories, identification and condition assessment of treaty resources, negotiations and consultation with state and federal government agencies regarding the management of treaty resources within the ceded territories, and litigation pertaining to the treaties of member tribes.

excerpted from Danielsen and Gilbert 2002
Nontimber Forest Products in the United States

[1] There are several terms used in reference to the Ojibwe people. The Ojibwe people often call themselves Anishinaabe which in their language means Indian person or original people. The anglicized word for Ojibwe is Chippewa.

[2] Ojibwe language

[3] See People v. Jondreau, 384 Mich 539, 185 N.W. 2d 375 (1971); State of Wisconsin v. Gurnoe, 53 Wis. 2d 390 (1972); U.S. v. Michigan, 471 F.Supp. 192 (W.D. Mich. 1979); Lac Courte Oreilles v. Voigt (LCO I), 700 F. 2d 341 (7th Cir. 1983), cert. denied 464 U.S. 805 (1983); Lac Courte Oreilles v. State of Wisconsin (LCO III), 653 F.Supp. 1420 (W.D. Wis. 1987); Lac Courte Oreilles v. State of Wisconsin (LCO IV), 668 F.Supp. 1233 (W.D. Wis.1987); Lac Courte Oreilles v. State of Wisconsin (LCO V), 686 F.Supp. 226 (W.D. Wis. 1988); Lac Courte Oreilles v. State of Wisconsin (LCO VI), 707 F.Supp. 1034 (W.D. Wis. 1989); Lac Courte Oreilles v State of Wisconsin (LCO VII), 740 F.Supp. 1400 (W.D. Wis. 1990); Lac Courte Oreilles v. State of Wisconsin (LCO VIII), 749 F.Supp. 913 (W.D. Wis. 1990); Lac Courte Oreilles v. State of Wisconsin (IX), 758 F.Supp. 1262 (W.D. Wis. 1991); Lac Courte Oreilles v. State of Wisconsin (X), 775 F.Supp. 321 (W.D. Wis. 1991); U.S. v. Bresette, 761 F.Supp. 658 (D. Minn. 1991); Mille Lacs Band v. State of Minnesota, 861 F.Supp. 784 (D. Minn. 1994); Mille Lacs Band v. State of Minnesota, 952 F.Supp. 1362 (D. Minn. 1997); Mille Lacs Band v. State of Minnesota, 124 F.3d904 (8th Cir. 1997); State of Minnesota v. Mille Lacs Band, 119 S.Ct. 1187 (1999).

[4] LCO III, 653 F.Supp. 1420, 1426 (W.D. Wis. 1987).

[5] GLIFWC's current member tribes include: in Wisconsin -- the Bad River Band of the Lake Superior Tribe of Chippewa Indians, Lac du Flambeau Band of Lake Superior Chippewa Indians, Lac Courte Oreilles Band of Lake Superior Chippewa Indians, Red Cliff Band of the Lake Superior Chippewa Indians, St. Croix Chippewa Indians of Wisconsin, and Sokaogon Chippewa Community of the Mole Lake Band; in Michigan -- Bay Mills Indian Community, Keweenaw Bay Indian Community, and Lac Vieux Desert Band of Lake Superior Chippewa Indians; and in Minnesota -- Fond du Lac Chippewa Tribe and Mille Lacs Band of Chippewa Indians.

APPENDIX MAPS