



## Threats to Wild Plants in the Ceded Territories

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## INTRODUCTION

*“Then Kitche Manitou made the plant beings. These were four kinds: flowers, grasses, trees, and vegetables. To each he gave a spirit of life, growth, healing, and beauty. Each he placed where it would be the most beneficial, and lend to earth the greatest beauty and harmony and order” (Johnston 1976).*

In 2000, funds were received from the Administration for Native Americans (ANA) for a two-year project to fulfill proposed grant objectives related to wild plants. One of those objectives, fulfilled by this document, was to determine current threats to wild plants in the territory ceded by various treaties between the US Government and the Chippewa.

Treaties signed by the Anishinaabe<sup>1</sup> in 1836, 1837, 1842, and 1854 ceded vast tracts of land to the US in an area that is currently within portions of the states of Wisconsin, Michigan, and Minnesota (Figure 1). In return, the Anishinaabe were guaranteed hunting, fishing, and gathering rights in the ceded area. These treaty reserved rights guaranteed that the tribes could continue their way of life to meet their subsistence, economic, cultural, spiritual, and medicinal needs (Erickson 2002).

Teaching the use and proper gathering techniques of wild plants to younger generations has always been an integral part of this life way. Today, this type of knowledge is referred to as traditional ecological knowledge and wisdom.

## METHODS

Berkes (1999) defines traditional ecological knowledge and wisdom (TEKW or TEK) as “a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.” TEK does not reflect a stagnant inventory of information but rather, without disregarding past wisdom, continues to transform through time. For cultures dependent on oral traditions, traditional stories often reflect the understanding that human survival requires an authentic respect towards nature and that resource use must necessarily be sustainable (Danielsen and Gilbert 2002). The scientific community is gradually acknowledging TEK as an authoritative source of information (Ford and Martinez 2000; Huntington 2000).

Among the Anishinaabe and other native peoples, tribal elders are held in high regard and are respected for the knowledge and wisdom gained over the course of his or her life. To learn about what it means to be Anishinaabe and the traditional way of doing things, youth are taught to spend time with and to ask questions of the elders. With this

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<sup>1</sup> The Anishinaabe are also referred to as the Ojibwe and Chippewa

teaching in mind, staff from Great Lakes Indian Fish and Wildlife Commission (GLIFWC) held meetings on each of the reservations with tribal elders primarily to preserve their knowledge and wisdom about non-medicinal uses of plants (GLIFWC 2002).

To document the TEK shared by the elders, GLIFWC staff took detailed notes. In addition, when permitted by the elders, the interviews were audio and/or video taped. Attempts were made to transcribe every interview (Table 1). During these meetings, tribal elders identified threats to wild plants, which provided a partial basis for this document. The TEK was subsequently categorized and entered into a database (GLIFWC 2002).

GLIFWC staff also reviewed scientific literature. The elder identified threats to wild plants were used as key words to conduct searches on library databases at the University of Wisconsin-Madison (Table 2). A resulting bibliography was entered into a database, printouts of various journal articles were obtained, and articles were reviewed to extract information on identified threats. The list of key words was expanded based on threats identified in the literature.

Certainly, the list of threats to wild plants presented in this report is incomplete. With more time to talk with other elders and to search the literature, additional threats would likely emerge. Nevertheless, this process of using TEK as the foundation for a scientific review was a unique way of examining potential threats to wild plants.

Researchers have often obtained TEK without giving credit to the individual sharing that information. Many view this practice as a violation of traditional intellectual property rights. Consequently, in this document, TEK has been properly credited to the appropriate tribal elders. The reader is reminded that any subsequent use of this information should also properly credit the appropriate tribal elders.

## RESULTS

### Pre-Treaty Influences on Vegetation in the Ceded Territory

Curtis (1959) stated that prior to European explorers entering the Lake Superior region, native peoples influenced their surrounding vegetation primarily in five ways. First, fire was used to clear land and improve desired vegetation growth such as berries. Day (1953) reported that native people used fire to improve visibility and travel. Loope and Anderson (1998) studied the occurrence of fire near the coastal areas of northern Michigan and Wisconsin. They recovered evidence that suggested that the occurrence of fire was up to ten times greater than the present rate of lightning caused fire. Second, desired food crops were raised using agriculture practices. Third, native plants were harvested. Fourth, animals were hunted which influenced their relative populations. Fifth, desired plants were introduced.

Curtis (1959) further surmised that the vegetation before 1600 was largely a result of the physical factors of the soil, topography, climate, and anthropogenic factors produced by a stable or slowly changing series of human populations. He asserts that fires affected much of the land to varying degrees and intensities, with the possible exception of the mesic forests.

### Post-Treaty Influences on Vegetation in the Ceded Territory

Following land cession treaties with the Anishinaabe in the early to mid 1800's, the northern forest and plant communities were changed dramatically by logging and fire. Ahlgren and Ahlgren (1983) stated that no force since glaciation effected the landscape as much as logging during the "cutover period." Timber harvest of the pine forests began along major river ways that could be used to float timber downstream to sawmills (Stearns 1977). In the 1870's additional areas were opened to year-round logging by railroads (Wisconsin Cartographers Guild 1998). The peak year of lumber production in Michigan was 1890, while in Wisconsin the height of the lumber boom was in 1899 when 3.4 billion board feet were harvested (Wisconsin State Historical Society 2002, Stearns 1997). The slash that remained after the cutover provided fuel for intense fires that ravaged the landscape. Fire coupled with the loss of conifer seed sources and a fire-degraded soil converted the landscape into one covered by early successional species. (Curtis 1959).

The most noticeable difference between the forests prior to logging and today is the amount of old-growth forest (Meeker et al. 1993). Less than one percent of the original forest which existed prior to the cutover period remains (Frelich 1995). The present state of the landscape is a fragmented matrix of small stands of relatively mature forest surrounded by larger stands of younger successional forest, along with human development such as housing, highway networks, agriculture, and industry (Meeker et al. 1993).

## Current Threats to Wild Plants: Tribal Elders (Table 3)

### Harvest

Elders identified the overharvest of plants such as manoomin (wild rice, *Zizania palustris*)<sup>2</sup>, wiingashk (sweet grass, *Hierochloe hirta*), bagaaniminzh (hazelnut, *Corylus cornuta*) and zhooniyaawijiibik (ginseng, *Panax quinquefolium*) to be potentially devastating (Elmer J. LeBlanc, TEK int., 2000; Joseph J. Chosa, TEK int., 2000; Rebecca Munz, TEK int., 2000; Hildreth Thomas, TEK int., 2002). These elders warned of the loss of these plants for future generations.

The commercialization of manoomin has especially triggered the elders' concerns about overharvest (Arnold Bigboy Sr., TEK int., 2001). Furthermore, a patent for "cytoplasmic genetic male sterility" in manoomin has been recently approved for use within the paddy rice industry. Opponents renounce this patent, claiming it as being offensive and irresponsible, considering the spiritual importance of manoomin to the Anishinaabe and other Indian tribes. They are also troubled by the potential for the altered genetic material to enter and impact native manoomin beds (LaDuke 2002).

Many elders considered improper harvest techniques as a major threat, particularly to manoomin. A St. Croix elder (TEK int., 2000) lamented about watching a group of harvesters using barbed wire on their rice knockers that resulted in less seed falling into the water and thereby limited the following year's crop. Robert Powless Sr. (TEK int., 2001) and Leroy Defoe (TEK int., 2001) mentioned that many inexperienced harvesters, Indian and non-Indian, fail to learn proper harvest techniques from elders. The harvest of manoomin before ripening especially distressed a number of elders (Florence Greensky, TEK int., 2001; Jean Songetay, TEK int., 2001; Joseph J. Chosa, TEK int., 2001). If manoomin falls into the water before ripening, it will not germinate the following year.

In addition, many elders identified the non-harvest of plants as a potential risk. Plants will "go away," if not used and cared for (Betty Kegg, TEK int., 2001; Temperance E. Debé, TEK int., 2001; Florence Greensky, TEK int., 2001; Elizabeth Dearbin, TEK int., 2001, Hildreth Thomas, TEK int., 2001). Plants mentioned include manoomin (wild rice), bagaaniminzh (hazelnut), mashkiigiminagaawanzh (cranberry, *Vaccinium macrocarpon*), miinagaawanzh (blueberry, *V. angustifolium*), ininaatig (sugar maple, *Acer saccharum*) asasaweminagaawanzh (choke cherry, *Prunus virginiana*) and wiigwaasi-mitig (paper birch, *Betula papyrifera*). Elders pointed out that the ability to harvest plants continues to decline as public lands are sold into private ownership and private landowners allow less accessibility (Peter McGeshick, TEK int., 2001; Charles Peter McGeshick, TEK int., 2001; Doug Sam, TEK int., 2001; Hildreth Thomas, TEJ int., 2001).

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<sup>2</sup> Anishinaabe name (Ojibwemowin) listed first, followed by English name and scientific name. Table 5 provides a listing of the wild plants identified in this document under all three naming systems.

## Chemical Spraying

Many elders identified pesticides, including herbicides and insecticides, as a serious threat to wild plants. They described their observations of chemical spraying on roadsides, on farmlands, and within wildlands. They raised concerns about the effects of these chemicals on the growth of plants, production of fruit, and the health of harvesters (Isabella Chosa, TEK int., 2001; Betty Kegg, TEK int., 2001; Hildreth Thomas, TEK int., 2002; Charles Peter McGeshick, TEK int., 2001; Doug Sam, TEK int., 2001; Leslie Barney, TEK int., 2001; Pat Northrup, TEK int., 2001; Elizabeth M. Vetterneck, TEK int., 2000; George W. Brown Jr., TEK int., 2000; Constance T. Lang, TEK int. 2001; Loretta H. Dietzler, TEK int., 2001; Florence Greensky, TEK int., 2001; Marcella Beson, TEK int., 2000; Corrine E. Wick, TEK int., 2001; Hildreth Thomas, TEK int., 2001; Joyce Einertson, TEK int., 2001; Robert Diver, TEK int., 2001; Darrell Kegg, TEK int., 2001; James D. White Sr., TEK int., 2001).

The elders noted that many plants seem to be producing less fruit. They suggested that chemical spraying might be reducing the number of pollinators (Corrine E. Wick, TEK int., 2001; Charles Peter McGeshick, TEK int., 2001; Richard Ackley Sr., TEK int., 2001; Donald Grey, TEK int., 2000; Sylvia Cloud-Parisien, TEK int., 2001). Most of these elders expressed concerns that, in recent years, they have seen fewer bees and butterflies. Some of the plants identified as being threatened by chemical spraying and the reduction in pollinators include bagaaniminzh (hazelnut), wiigwaasi-mitig (paper birch), miinagaawanzh (blueberry), asasaweminagaawanzh (choke cherry), ininaatig (sugar maple), manoomin (wild rice), bawa'iminagaawanzh (pin cherry, *Prunus pennsylvanica*), odatagaagominagaawanzh (blackberry, *Rubus allegheniensis*), bagwaaji bagaanesan (wild plum, *Prunus americana*), bizhikiwiginiig (wild rose, *Rosa blanda*), waagaag (ferns, various species), miskomin (raspberry, *Rubus idaeus*), ode'immin (strawberry, *Fragaria virginiana*) apaakwaanaatig (sumac, *Rhus glabra*), mashkodewashk (sage, *Artemisia ludoviciana*), and zhaaboominagaawanzh (gooseberry, *Ribes americana*).

## Pollution

Elders frequently labeled acid rain and other types of air pollution as serious threats to wild plants (Randy Wise, TEK int., 2001; William J. Houle, TEK int., 2001, Raymond Smith Sr., TEK int., 2000; Madeline Schreyer, TEK int., 2001; George W. Brown, TEK int., 2000; Delia Moreland, TEK int., 2001; Temperance E. Debe, TEK int., 2001; Raymond J. Larson Jr., TEK int., 2001). They blamed air pollution for stunted plant growth and reduced fruit production. The plants they identified as being potentially affected include odatagaagominagaawanzh (blackberry), miinagaawanzh (blueberry), asasaweminagaawanzh (choke cherry), bawa'iminagaawanzh (pin cherry), miskomin (raspberry), ode'immin (strawberry), apaakwaanaatig (sumac), manoomin (wild rice), bagwaaji bagaanesan (wild plum, *Prunus americana*), and apakweshkway (cattail, *Typha latifolia*).

Water pollution was a concern of elders, particularly for wetland plants such as manoomin (wild rice), mashkiigiminagaawanzh (cranberry) and apakweshkway (cattail). Betty Kegg (TEK int., 2001) and Doug Sam (TEK int., 2001) mentioned surface and groundwater contamination by fertilizers and other chemicals used for agricultural purposes. Raymond J. Larson Jr. (TEK int., 2001) expressed unease about industrial emissions directly into lakes, streams, and rivers. Rita Nelson (TEK int., 2001), Pat Northrup (TEK int., 2001), and Temperence E. Debe (TEK int., 2000) stated their concerns about motor oil and gasoline residues and runoff from vehicles, including snowmobiles on frozen lakes. Pollution arising from mining activities was noted to be one of the more serious threats to wetland plants (Peter McGeshick Jr., TEK int., 2001).

### **Climate Change**

Related to pollution, elders remarked that climate change could become a serious problem for wild plants. Bob Bassett (TEK int., 2001) and Les Northrup (TEK int., 2001) blamed a declining harvest of miinan (blueberries) on increasingly wetter and colder summers. Randy Wise (TEK int., 2001) and Rose Tainter (TEK int., 2000) blamed increasing precipitation for declining manoomin (wild rice) harvests.

### **Road Salt**

Several elders cited the practice of applying road salt as a threat to wild plants (Joyce Einertson, TEK int., 2001; Deanna Baker, TEK int., 2000; Virgil Loonsfoot, TEK int., 2000; Audrey Lyons, TEK int., 2000; Rita Nelson, TEK int., 2001; Ruth Holmes, TEK int., 2001; Myrtle Gauthier, TEK int., 2000; Ruth Holmes, TEK int., 2001; Barbara Mantilla, TEK int., 2000). Roadside plants seemingly affected by road salt include odatagaagominagaawanzh (blackberry), miinagaawanzh (blueberry), bagwaji bagaanesan (wild plum), bagaaniminzh (hazelnut), wiigwaasi-mitig (paper birch), aniibiimin (highbush cranberry, *Viburnum opulus* var. *americana*), and mashkiigwaatig (tamarack, *Larix laricina*).

### **Land Use: Human Developments**

According to the elders, the construction of buildings, roads, and utility lines has severely impacted wild plants (Myrtle Gauthier, TEK int., 2000; Elizabeth Vetterneck, TEK int., 2000; Virgil Loonsfoot, TEK int., 2000; Isabelle Chosa, TEK int., 2000; Barbara Mantilla, TEK int., 2000; Joseph Duffy, TEK int., 2001; Les Northrup, TEK int., 2001; Loretta Martineau, TEK int., 2001; Leo LaFernier, TEK int., 2001; Don Wiessen, TEK int., 2001; Jim Northrup, TEK int., 2001; Margaret Ojibway, TEK int., 2001; Velma McGeshick-Landru, TEK int., 2001; Elizabeth Dearbin, TEK int. 2001; Marcella Beson, TEK int., 2000; Elmer J. LeBlanc, TEK int., 2000; Helen Smith, TEK int., 2000; Hildreth Thomas, TEK int., 2001; Doug Sam, TEK int., 2001; Ruth J. Antone, TEK int., 2001; Ray A. McGeshick Sr., TEK int., 2001; Wanda Pellerin, TEK int., 2001; Leona Ledbetter, TEK int., 2000; Delia Moreland, TEK int., 2001; Geraldine Parish, TEK int.,

2000; Ferdinand Martineau, TEK int., 2001; Frank Montano, TEK int., 2001; Arnold Bigboy Sr., TEK int., 2001; Lucy Dewing, TEK int., 2001; Corrine E. Wick, TEK int., 2001) Many past wild plant gathering locations no longer exist due to some type of manmade development.

Wild plants that have been affected by construction projects include bagaaniminzh (hazelnut), odatagaagominagaawanzh (blackberry), miinagaawanzh (blueberry), asasaweminagaawanzh (choke cherry), wiigwaasi-mitig (paper birch), zhaaboominagaawanzh (gooseberry), bawa`iminagaawanzh (pin cherry), miskomin (raspberry), ode`imin (strawberry), bagwaaji bagaanesan (wild plum), manoomin (wild rice), mashkiigiminagaawanzh (cranberry), ininaatig (sugar maple), wiigashk (sweet grass), giizhik (northern white cedar, *Thuja occidentalis*), miskwaabiimizh (red osier dogwood, *Cornus stolonifera*), oziisigobimizh (willow, *Salix* spp.), wiinisiibag (wintergreen, *Gaultheria procumbens*), namewaskoonzh (mint, *Mentha arvensis* var. *canadensis*), sasap-kwanins (wild bergamont, *Monarda fistulosa*), minensagaawanzh (hawthorn, *Crataegus pedicellata*), gozigwaakomin (juneberry, *Amelanchier laevis*), sewa`komin (sand cherry, *Prunus prumila*), and waagaag (various fern species).

Elders also expressed their objections to the construction of dams that alter the hydrology of wild plant gathering areas. They described how the dam that created the Chippewa Flowage flooded manoomin (wild rice) beds and forced the relocation of villages (Art Tainter, TEK int., 2000; Phyllis DeBrot; TEK int., 2000). This dam devastated the economic and spiritual wellbeing of the whole tribal community (Rasmussen 1998). Another dam built on Lac Vieux Desert disrupted water levels and ruined manoomin and mashkiigiminagaawanzh (cranberry) gathering areas (Rose Martin, TEK int., 2001; Ruth J. Antone, TEK int., 2000; Ira A. Antone, TEK int., 2000; Helen Smith, TEK int., 2000; Raymond Smith Sr., TEK int., 2000).

Levees and channels, built to protect farmlands and manmade developments, were also identified as threats to manoomin and mashkiigiminagaawanzh (William J. Houle, TEK int., 2001; Jim Northrup, TEK int., 2001; Betty Kegg, TEK int., 2001; Darrell Kegg, TEK int., 2001; Barbara Mantilla, TEK int., 2000; Doug Sam, TEK int., 2001; Florence Greensky, TEK int., 2001; Raymond J. Larson Jr., TEK int., 2001; Constance T. Lang, TEK int., 2001; Loretta H. Dietzler, TEK int., 2001). These structures change water levels, draining some areas and flooding others. In addition, channel dredging negatively impacts manoomin beds (Sylvia Cloud-Parisien, TEK int., 2001).

Elders mentioned vegetation competition, caused by water level changes and other various factors, as another threat to manoomin (Jim Northrup, TEK int., 2001; Pat Northrup, TEK int., 2001; Ruth J. Antone, TEK int., 2000; Harold Crowe, TEK int., 2001; Clarence Crowe, TEK int., 2001). For example, changes in water levels allow other wetland plant species (e.g., waabiziipin - arrowhead, *Sagittaria latifolia*; oga`damun - yellow water lily, *Nuphar advena*; and purple loosestrife, *Lythrum salicaria*) to grow and eventually replace manoomin.

### Land Use: Recreation

Many elders stated that motorboats continue to threaten manoomin (wild rice) beds (Leona Ledbetter, TEK int., 2000; Phyllis DeBrot, TEK int., 2000; Sylvia Cloud-Parisien, TEK int., 2000; Robert Van Zile, TEK int., 2001; Joseph J. Chosa, TEK int., 2000; Deanna Baker, TEK int., 2000, Jim Northrup, TEK int., 2001). Wakes from speeding motorboats cause the roots of manoomin to be pulled right up from the muddy lake bottom. Elders also listed snowmobiles and all-terrain vehicles as threats to wild plants (Ruth Holmes, TEK int., 2002; Lac Du Flambeau elder, TEK int., 2000).

### Land Use: Logging

Many elders recognized logging, particularly clearcutting, to be a threat to trees and the smaller plants growing beneath (understory plants). Joseph J. Chosa (TEK int., 2000) and William Ackley (TEK int., 2000) noted that wiigwaasi-mitig (paper birch) is often cut before reaching a large diameter. Other trees identified as being affected by logging include ininaatig (sugar maple), giizhik (white cedar), zhingwaak (white pine, *Pinus strobus*), apakwanagemag (red pine, *Pinus resinosa*), baapaagimaak (white ash, *Fraxinus americana*), mitigomizh (red oak, *Quercus rubra*), wiigob-atig (basswood, *Tilia americana*), and okikaandag (jack pine, *Pinus banksiana*) (Florence Greensky, TEK int., 2001; Jim Northrup, TEK int., 2001; Pat Northrup, TEK int., 2001; Kenneth G. Tainter, TEK int., 2000; Loretta H. Dietzler, TEK int., 2001; Peter McGeshick III, TEK int., 2001; Elmer J. LeBlanc, TEK int., 2000; Constance T. Lang, TEK int., 2001; Leonard Sam, TEK int., 2001; Joseph M. Rose, TEK int., 2001; Doug Sam, TEK int., 2001; Joseph J. Chosa, TEK int., 2000; Clifford Parish Sr., TEK int., 2000; Corrine E. Wick, TEK int., 2001; Myra J. Pitts, TEK int., 2001).

Elders noted that some of the effects of logging on understory plants included increased light, temperatures, drought conditions, and competing vegetation (Margaret Ojibway, TEK int., 2001; Donald Grey, TEK int., 2000; Evelyn Benter, TEK int., 2001; Rebecca Munz, TEK int., 2000; Florence Greensky, TEK int., 2001; Jim Northrup, TEK int., 2001; Elmer J. LeBlanc, TEK int., 2000; Betty Kegg, TEK int., 2001; Leonard Sam, TEK int., 2001; Kenneth G. Tainter, TEK int., 2000; Temperence E. Debe, TEK int., 2001; Don Wiessen, TEK int., 2001; Raymond J. Larson Jr., TEK int., 2001; Myrtle Gauthier, TEK int., 2000; Virgil Loonsfoot, TEK int., 2000). Some of the affected understory plants identified include bagaaniminzh (hazelnut), odatagaagominagaawanzh (blackberry), miinagaawanzh (blueberry), asasaweminagaawanzh (choke cherry), zhaaboominagaawanzh (gooseberry), bawa'iminagaawanzh (pin cherry), miskomin (raspberry), bagwaaji bagaanesan (wild plum), miskwaabiimizh (red osier dogwood), oziisigobimizh (willow), waagaag (ferns), gozigwaakomin (juneberry), wiinisiibag (wintergreen, *Gaultheria procumbens*), waabigoniin (cowslip, *Caltha palustris*), doodooshaaboojiibik (dandelion, *Taraxacum officinale*), shahboosigan (milkweed, *Asclepius syriaca*), bagwaji zhigaagananzh (wild onion, *Allium stellatum*), and bagwaj zhoomin (wild grape, *Vitis riparia*).

## **Land Use: Fire Suppression**

Many elders claimed that the fire suppression practices first implemented in the 1930's have led to the reduction of a number of wild plants (Leonard Sam, TEK int., 2001; Rebecca Munz, TEK int., 2000; Clifford Parish Sr., TEK int., 2000; Isabella Chosa, TEK int., 2000; Myrtle Gauthier, TEK int., 2000; Don Wiessen, TEK int., 2001; Betty Kegg, TEK int., 2001; Virgil Loonsfoot, TEK int., 2000). Fire has been a "management tool" used by American Indians for centuries for various objectives including the enhancement of certain wild plant species (Day 1953).

Elders have observed an increase of competing vegetation resulting in the decline of plants such as bagaanimizinzh (hazelnut), odatagaagominagaawanzh (blackberry), miinagaawanzh (blueberry), asasaweminagaawanzh (choke cherry), zhaaboominagaawanzh (gooseberry), bagwaaji bagaanesan (wild plum), ode'iminn (strawberry), gozigwaakomin (juneberry), waagaag (ferns), and bagwaj zhoomin (wild grape) (Darlene Kupsco, TEK int., 2001; Judy Topping, TEK int., 2001; Les Northrup, TEK int., 2001; Evelyn Benter, TEK int., 2001; Elmer J. LeBlanc, TEK int., 2000; Florence Greensky, TEK int., 2001; Isabelle Chosa, TEK int., 2000; Katherine Olson, TEK int., 2000; Temperence E. Debc, TEK int., 2001; Leonard Sam, TEK int., 2001; Ferdinand Martineau, TEK int., 2001; Don Wiessen, TEK int., 2001; Arnold Bigboy Sr., TEK int., 2001). Leonard Sam (TEK int., 2001) and Don Wiessen (TEK int., 2001) stated that fire suppression has reduced seedling establishment and survival for wiigwaasi-mitig (paper birch).

## **Disease and Pests**

Elders mentioned wild plants apparently dying from disease and pests. Several elders blamed a fungus and the birch borer as damaging and killing wiigwaasi-mitig (paper birch) (Ray A. McGeshick Sr., TEK int., 2001; Hildreth Thomas, TEK int., 2001; Ruth Holmes, TEK int., 2001; Bob Bassett, TEK int., 2001, Leonard Sam, TEK int., 2001; Joseph J. Chosa, TEK int., 2000). Florence Greensky (TEK int., 2001) and Myrtle Soukkala (TEK int., 2001) have observed a fungus affecting asasaweminagaawanzh (choke cherry). Joseph J. Chosa (TEK int., 2001) noted a fungus on manoomin (wild rice). Leonard Sam (TEK int., 2001) has noticed a fungus growing on giizhik (white cedar).

## Current Threats to Wild Plants: Scientific Literature (Table 4)

### Harvest

Though Indians and non-Indians have long gathered wild plants, only recently have the quantities gathered increased dramatically. The commercialism of wild plants has been heightened by the rise in individuals desiring natural products. In addition, as timber jobs decline due to mechanization and fewer harvests, more individuals have turned to gathering wild plants as a source of income (McLain and Jones 2002).

The increase in wild plant gathering for commercial purposes has created concerns regarding the sustainability of these products. The World Commission on Environment and Development defined "sustainability" in 1987 as "development to meet the needs of the present without compromising the ability of future generation to meet their own needs" (Vance 2002).

Currently, the consequences from increased wild plant gathering remains unknown and considered relatively insignificant by land managers. Few scientific studies have specifically addressed the sustainability of gathered wild plants and their ecosystems. On federal lands, policies generally fail to fully address issues associated with the gathering of wild plants (Antypas et al. 2002).

### Chemical Spraying

Several decades ago, scientists signaled warnings regarding the effects of pesticides and other chemicals on humans and the environment. The publication of Rachel Carson's *Silent Spring* in 1962, which described the adverse effects of chemicals, first brought this concern to the general public. During the 1970's, federal legislation began regulating the release of chemicals into the environment.

Pesticides sprayed by aircraft or land vehicles often reach unintended targets. Some researchers estimate that up to 50% of sprayed pesticides drift into the air (Vogl 1976). Adverse effects to unintended targets may be acute or chronic. Some species may exhibit increased death rates, reduced growth, reduced reproductive capabilities, disruption of physiological functions, and genetic alteration (Extension Toxicology Network 2002).

For example, pesticides used in agricultural and forestry practices have resulted in the unintended mortality of many pollinators (Kearns and Innouye 1997). Pesticide drift has become particularly contentious regarding human health, given that 60% percent of all pesticides are potentially carcinogenic (Klien and Wenner 1991).

Furthermore, pesticides may indirectly impact species. The application of pesticides to control weeds and clear roadsides has reduced the availability of native plants for pollinators. As more people have become aware of the adverse effects of

pesticides, aerial spraying to control forest insects and vegetation has become extremely controversial (Hays 1983).

### **Pollution: Acid Rain**

Atmospheric release of pollutants occurs through dry deposition, cloud deposition, and wet deposition (Lovett 1994). Dry deposition is the direct release of pollutants to soil, vegetation, or surface water. Cloud deposition entails the capture of pollutants by clouds and fog and eventual direct release, without precipitation, to terrestrial surfaces (Lovett 1994). Wet deposition entails the release of pollutants through precipitation. Acid rain, a common form of wet deposition, consists of sulfur dioxide and nitrogen oxides, emitted largely from the combustion of fossil fuels, that react with water and oxygen to form acidic compounds (USEPA 1999).

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN) has been monitoring wet deposition in North America since 1978. Several monitoring stations are located within the ceded territories (Figure 2). Data from NADP/NTN (2002) indicates a decreasing acidity from east to west (Michigan to Minnesota), as also reported by Glass and Loucks (1986). The NADP/NTN data also indicates an overall decrease in average precipitation acidity (Figure 3). This decrease is likely a result of more aggressive regulations reducing emissions of sulfur dioxide and nitrogen oxides (USEPA 1999).

The effects of acid rain on vegetation depend largely upon the relative acidity of the deposition (Raynal et al. 1982). Furthermore, younger plants tend to be most sensitive to acid rain. Lee and Weber (1979) listed the effects on plants including foliar injury, influences on growth, excessive leaching of nutrients from the soil and plant foliage, inhibition or stimulation of certain plant diseases, and an inhibition of the nitrogen-fixing activities of legumes.

These effects sometime lead directly to forest decline, as witnessed in many regions of the world. Within the ceded territories, these effects may indirectly lead to decline by increasing the forest's vulnerability to other pollutants, climatic extremes, and pest attacks (WDNR 2002a).

### **Pollution: Tropospheric Ozone**

Tropospheric (ground level) ozone is a secondary pollutant formed under conditions of bright sunlight, warm temperatures, and reactions with nitrogen oxides and hydrocarbons (Skelly 2000). Tropospheric ozone intensifies as emissions of carbon monoxide, nitrogen oxides, and volatile organic compounds increase (Manning and Tiedemann 1995).

Ozone concentrations are highest in summer and lowest in the winter (Lovett 1994). In pristine areas, ozone concentrations range from 20-40 parts per billion (ppb)

during the summer, though occasionally increasing to 60-80 ppb for short time periods (Dickson et al. 2000). In 1997, the Environmental Protection Agency reduced the federal air quality standard for ozone from 120 ppb to 80 ppb. However, this new standard is currently being challenged in court. Except for Anoka County, MN in 2001, ozone concentrations within the ceded territories have remained below 120 ppb (USEPA 2002a).

Ozone has been estimated to cause over \$500 million in annual reductions of agricultural and commercial forest yields (EPA 2002b). Visible symptoms from ozone exposure are either acute or chronic. Acute exposure symptoms appear within several hours or days and include the development of light tan to dark brown spots on the leaves. Chronic exposure symptoms develop more slowly and may be identified through modifications in the upper leaf surface pigmentation, premature leaf senescence, and early leaf fall. Chronic exposure symptoms have been observed in northeast United States. However, clear estimates for acreage of affected forest is lacking because the identification of ozone induced plant injury can often be confused with symptoms of other conditions (Skelly 2000).

Ozone induced foliar injury to zhingwaak (white pine) and azaadi (aspen, *Populus grandidentata* and *P. tremuloides*) has been reported in northern Wisconsin (Figure 4). Chappelka and Chevone (1986) observed in the laboratory that ozone concentrations greater than 50 ppb resulted in a decrease of growth for baapaagimaak (white ash). Reich and Amundson (1985) in a laboratory study demonstrated that chronic exposure to increasing concentrations of ozone resulted in a decline in net photosynthesis for ininaatig (sugar maple), zhingwaak (white pine), and mitigomizh (red oak) with no classic symptoms of visible injury. Several plant species native to the Great Lakes region are used as ozone bioindicators (USFS 2002b). These plants include odatagaagominagaawanzh (blackberry), bawa'iminagaawanzh (pin cherry), shaaboosigan (common milkweed), baapaagimaak (white ash), migiziibag (big leaf aster, *Aster macrophyllus*), and ookweminagaawanzh (black cherry, *Prunus serotina*).

#### **Pollution: Ultraviolet-B Radiation**

Stratospheric ozone levels were reported to have declined by around 10% in the northern mid-latitudes between 1979-1993 due to the past atmospheric release of ozone-depleting substances by humans (Cybulski III and Peterjohn 1999). This decline in stratospheric ozone has led to an increase in ultraviolet-B (UV-B) radiation (Caldwell et al. 1995). Although many nations signed the Montreal Protocol (USEPA 2002c) that recognized the need to protect the stratospheric ozone levels, continued damage will reach far into the future because ozone-depleting substances break down very slowly.

Elevated levels of ultraviolet-B are known to inhibit plant growth (Huttunen et al. 1998) but the effects of UV-B exposure sensitivity varies among plant species. Sullivan and Teramura (1988) studied the effects of UV-B in the Pinaceae and reported that needle discoloration and stunting were observed in apakwanagemag (red pine) while no

statistically significant effects were observed in zhingwaak (white pine) or gaawaandag (white spruce, *Picea glauca*). Torabinejad et al. (1998) demonstrated the susceptibility of pollen to UV-B and suggested that species in which pollination occurs earlier in the year are likely to be most susceptible.

### **Climate Change**

Fossil fuel (e.g. coal, oil, natural gas) burned throughout the world is believed to be causing an increase in "greenhouse" gas levels and in turn, the earth's temperature. While various gases are released during the combustion of fossil fuel, carbon dioxide has been monitored most closely in part because of its role in plant photosynthesis.

Carbon dioxide levels reportedly increased from a pre-industrial level of around 280 parts per million (ppm) to nearly 370 ppm in 1998, and are increasing further by about 1.5-2.0 ppm each year (Kirschbaum 2000). Depending on future emissions by humans, carbon dioxide concentration in the atmosphere will probably double to over 700 ppm within the next 100-150 years (Dickson et al. 2000).

Temperature in the upper Great Lakes region over the twentieth century has increased by almost four degrees Fahrenheit (NAST 2000). All climate models predict a continuing warming trend for this region with temperature increase estimates varying from 5-10 degrees Fahrenheit. Furthermore, model forecasts predict increased precipitation for Midwest United States, but substantial increases in evaporation are likely to cause soil moisture deficits and more drought-like conditions (NAST 2000). This increased precipitation is more likely to be coming from heavy and extreme precipitation events.

Assuming a doubling of carbon dioxide levels by 2100, Iverson and Prasad (1998) predicted a decrease in suitable habitat for many tree species within the ceded territories, including ininaatig (sugar maple), giizhik (white cedar), wiigwaasi-mitig (paper birch), and zhingob (balsam fir). Bazzaz et al. (1990) demonstrated that tree species use carbon dioxide differently and suggested that increased carbon dioxide levels might favor growth of some shade tolerant species.

One study (NAST 2000) revealed that the combination of increased temperature and changes in moisture might increase environmental stress on both deciduous and coniferous trees. This increased stress could raise the likelihood of disease and pest infestation, thus resulting in higher tree mortality rates. In addition, increases in heavy precipitation might lead to the acceleration of erosion and movement of nutrients into lakes and rivers.

### **Road Salt**

Road or de-icing salt is widely used to maintain roads free from ice and snow as a matter of public safety (Fleck et al. 1988). Of concern are the ecological effects of road

salt on adjacent water bodies and ground water where in some areas road salt has been shown to pollute wells (National Research Council 1991, Forman and Deblinger 2000). Also, impacts of road salt spray on vegetation have been detected as far as 150 meters from highways (Hofstra and Hall 1971).

Experimental studies have shown road salt to have negative effects on roadside trees (Hall et al. 1972, Lumis et al. 1976, Hofstra et al. 1979). Fleck et al. (1988) demonstrated mortality of wiigwaasi-mitig (paper birch) along roadsides exposed to direct salt inputs. As an indication of the seriousness of road salt as a pollutant, it was proposed to be considered "toxic" under the 1999 Canadian Environmental Protection Act (Environment and Health Canada 2000).

### **Land Use: Fragmentation and logging**

Land use practices over the last 200 years have transformed the once contiguous northern forests into fragmented and isolated patches of varying sizes surrounded by farmland, clearcuts, roads, and other human development. Currently, these forest fragments are either remnants of the original forest or second growth after the initial cutover in the late 1800's.

The reduction in forest patch size has resulted in increased disturbance, light, and temperature (Haila 1999). These impacts have significantly reduced the health of these forest fragments. For example, Rooney et al. (2001) resurveyed northern hardwood stands first sampled by Curtis (1959), and documented a decline in species diversity within the understory vegetation over the 50-year period between the two surveys.

Another effect of fragmentation has been an increased abundance of herbivores, such as waawaashkeshi (white-tailed deer, *Odocoileus virginianus*) and waabooz (snowshoe hare, *Lepus americana*). These animals benefited greatly from the proliferation of farmland and early successional forests created by clearcuts. Waawaashkeshi density prior to Euro-American settlement was approximately less than 4 individuals per square kilometer (Alverson et al. 1988). Recent estimates for winter density in the northern forest region of Wisconsin average between 10-15 individuals per square kilometer (WDNR 2002b, unpublished data).

The increase in herbivory, particularly from waawaashkeshi, has been blamed as one of the major factors contributing to a decline in many plant species. Herbivory causes the direct loss of individuals or inhibited reproduction (Rooney and Dress 1997). Impacted tree species include giizhik (white cedar), kaakaagiwanzh (eastern hemlock, *Tsuga canadensis*), and ne'bagandag (Canada yew, *Taxus canadensis*). Impacted herbaceous species include baushkindjibgwaun (white trillium, *Trillium grandiflorum*), godotaagaans (blue-bead lily, *Clintonia borealis*), neweia 'kvisink (sessile-leaved bellwort, *Uvularia sessilifolia*), and bebaamaabiig (wild sasparilla, *Aralia nudicaulis*) (Balgooyen and Waller 1995).

Fragmentation has also reduced the diversity and abundance of pollinators. Habitat alteration results in the loss of native food plants, rendezvous plants, and nesting sites used by pollinators. In addition, flowers found in small populations, receive fewer pollinators and receive more pollen from sibling plants, which results in low seed production (Kearns and Inouye 1997).

Reproductive dispersal may have also been impacted by fragmentation. Theoretically, as forest fragments become more isolated, the interchange of pollen and seed becomes less likely. As a consequence, changes in the genetic structure and diversity within the forest fragments may become more apparent (Crow et al. 1993).

Modern logging practices continue to influence the environment and affect the complex ecological relationship of plant abundance and regeneration, insects, disease, nutrients, and herbivory. Logging often results in a reduced amount of coarse woody debris. This material consists of logs and snags that function as plant and animal habitat, as sources and sinks in nutrient cycling, and as features affecting land forms, soil, and sediment transport (Tyrrell and Crow 1994, Harmon et al. 1986). The lack of coarse woody debris has been implicated in the lack of reproduction of kaakaagiwanzh (eastern hemlock), giizhik (white cedar), and other species (Mladenoff and Stearns 1993, Cornett et al. 2000). Many forested areas have been replanted and managed as monoculture plantations for pulp and paper production; this practice has resulted in a loss of biodiversity.

### **Land Use: Fire Suppression**

Modern suppression efforts have largely eliminated fire as a natural disturbance, and many property owners are legally restricted from burning areas. The result of these efforts has led to increasing canopy cover in formerly open habitats and increasing overall brush in some forested areas. Pine barrens, which were previously maintained by fire, have suffered from the lack of fire disturbance and, as a result, the species composition of vegetation in these areas has shifted. Another factor affecting the natural fire dynamics of this region is the increase in azaadi (aspen). In general, azaadi is more fire resistant than most conifer species (Ahlgren and Ahlgren 1983).

### **Disease and Pests**

Disease and pests are inherent within an ecosystem. Wild plants have developed defenses to reduce the effects of disease and pests. However, human activities may alter the frequency and intensity of disease and pest outbreaks. For example, the increased acreage of azaadi (aspen) through logging has resulted in longer and more frequent outbreaks of the forest tent caterpillar. Recurring outbreaks can lead to a decline in stand productivity and increase the susceptibility of trees to other pathogens (Ahlgren and Ahlgren 1983).

The susceptibility of wild plants to disease and pests will also likely be affected by climate change, acid rain, increased levels of ground level ozone and UV-B radiation, and exotic species. The combined effect of human activities on the health of wild plants remains unclear.

### **Exotic Species**

Exotic species are those that have spread through human activities to new areas outside their native range and include all life forms from disease causing organisms to plants, fish, and animals. In a new environment, exotic species are typically free from natural predators that would control their population. Consequently, exotic species tend to increase to levels that threaten the displacement of native plants and wildlife.

Exotic species have been introduced on purpose or accidentally (Mack 1991, Reichard and White 2001). Examples of the more invasive exotics within the ceded territories include purple loosestrife, Eurasian water milfoil, buckthorn, leafy spurge, sea lamprey, smelt, zebra mussel, gypsy moth, honeybee, Dutch elm disease, and white pine blister rust. The introduced honeybee has displaced native species and disrupted natural pollination systems (Kearns and Innouye 1997). Honeybees tend to be inefficient pollinators of many wild plants due to the diversity of flower morphology (O'Toole 1993).

Biological invasions by plants are one of the world's worst ecological problems (Colton and Alpert 1998, Vitousek et al. 1996, Williamson 1996). Exotic plants compete directly with native plants for water, light, nutrients, pollinators, and space (Stapanian et al. 1998). In the United States, exotic species have displaced native plants, reduced habitat suitability of native animals, and cost an estimated \$137 billion every year in control activities (Pimental et al. 2000). For the most part, however, the general public is only starting to comprehend the threat of invasive exotics plants (Colton and Alpert 1998).

### **Integration of TEK and Western Scientific Knowledge**

In general, TEK and Western scientific knowledge agree on the threats to wild plants. Both forms of knowledge support each other regarding the potential threats of chemical spraying, pollution, climate change, road salt, excessive logging, fire suppression, and disease and pests. Though the perceived degree of threat may be different between the tribal elders and scientists, all share the same basic concerns.

Both forms of knowledge recognize overharvest and improper harvest techniques as serious threats. However, land managers failed to acknowledge these threats wholeheartedly until after the 1930's for timber and only until recently for wild plants. The Anishinaabe have always had stories and traditions that warn against improper harvest. In addition, the notion that non-harvest could threaten wild plants, though prominent in the Anishinaabe culture, does not exist in scientific literature.

Scientists have demonstrated that exotic species, accidentally and purposely introduced by humans, threaten many native plants. Tribal elders also consider exotic species to be a threat when they begin to dominate specific habitats and outcompete useful wild plants such as when purple loosestrife invades manoomin (wild rice) beds. However, Anishinaabe wild plant gathering practices have also been extremely adaptable and uses for a number of exotic plants have been found.

Unlike tribal elders, scientists identify human caused changes in animal populations as a potential threat to wild plants. For example, scientists argue that the increased numbers of waawaashkeshi (white-tailed deer) over the last century, an apparent result of past land management activities, threaten to impact wild plants through intensified herbivory. Tribal elders, however, did not mention this concern.

## DISCUSSION

### Management Recommendations: Tribal Elders

Several elders discussed the need to practice and teach proper harvest techniques (Corrine E. Wick, TEK int., 2001; Robert Powless, TEK int., 2000). For example, Doug Sam (TEK int., 2001) and Loretta H. Dietzler (TEK int., 2001) stressed the importance of gathering only what is needed and only after putting down asema (tobacco) as an offering of thanks and respect. Rebecca Munz (TEK int., 2000) mentioned the importance of not damaging the roots of wiingashk (sweet grass) and not overtapping ininaatig (sugar maple) for sap. Ruth J. Antone (TEK int., 2000) talked about not picking cigona'gan (princess pine, *Lycopodium* spp.) while frost covers the ground.

Elders talked about the importance of teaching and using traditional techniques for harvesting manoomin (wild rice) (Raymond Smith Sr., TEK int., 2000; Doug Sam, TEK int., 2001; Ruth J. Antone, TEK int., 2000). May Jameson (TEK int., 2000) described the traditional practice of ricing for several days and then resting the manoomin beds for a couple of days. Other elders remembered when families identified gathering sites by tying strips of material around clumps of ripening manoomin (Arnold Bigboy, TEK int., 2000; Harold Crowe, TEK int., 2000; Sylvia Cloud-Parisien, TEK int., 2000). Corrine E. Wick (TEK int., 2001) stressed the importance waiting to harvest manoomin when fully ripe.

Tribal rice chiefs, selected for their knowledge and experience, have always taken the responsibility for determining harvest times. Currently, off-reservation in Wisconsin, that responsibility is shared with the state Department of Natural Resources. Several elders stated that the traditional role of tribal rice chiefs should be reestablished for off-reservation manoomin harvest sites (Joseph J. Chosa, TEK int., 2001; Jim Northrup, TEK int., 2001; John L. Thomas, TEK int., 2001; Pat Northrup, TEK int., 2001).

In addition to harvesting, wild plants need to be cared for. Temperance E. Debe (TEK int., 2001) and Myrtle Gauthier (TEK int., 2000) described the traditional practice of pruning old stems to promote the growth of miskomin (raspberry), bawa'iminagaawanzh (pin cherry), and bagaanimizinzh (hazelnut). Frank Montano (TEK int., 2001) asserted the importance of not cutting giizhik (white cedar) to promote layering – a process of vegetative reproduction by which giizhik branches arch to the forest floor, take root, and form a new genetically identical tree.

Harold Crowe (TEK int., 2001) and Velma McGeshick-Landru (TEK int., 2001) mentioned that their elders transplanted ode'immin (strawberry) and bagwaaji zhigaagananzh (wild onion) between various sites. John L. Thomas (TEK int., 2001) stated that tribal rice chiefs used to exchange manoomin seed with different communities. A number of elders suggested reseeding manoomin (wild rice) at past harvest sites using fully ripe seed (Elizabeth Dearbin, TEK int., 2001; Harold Crowe, TEK int., 2001; Jean

Songetay, TEK int., 2001; John L. Thomas, TEK int., 2001; Peter McGeshick Jr., TEK int., 2001; Ruth Holmes, TEK int., 2001).

Many elders suggested the use of controlled burns to promote miinagaawanzh (blueberry), miskomin (raspberry), asasaweminagaawanzh (choke cherry), odatagaagominagaawanzh (blackberry), ode'immin (strawberry), and minesagaawinzh (hawthorn, *Crataegus pedicellata*) (Joseph M. Rose, TEK int., 2000; Les Northrup, TEK int., 2001, Sam Jackey, TEK int., 2000; Myra Pitts, TEK int., 2001; Harold Crowe, TEK int., 2000; Joseph Duffy, TEK int., 2001; Mary E. Davis, TEK int., 2001; Ray A. McGeshick, TEK int., 2001; Peter McGeshick Jr., TEK int., 2001; Sylvia Cloud-Parisien, TEK int., 2000; Albert McGeshick, TEK int., 2001; Arnold Bigboy Sr. 2000; Charles Ackley, TEK int., 2001; Elmer J. LeBlanc, TEK int., 2000; Geraldine Parish, TEK int., 2000, Ira A. Antone, TEK int., 2001; John Wood, TEK int., 2001; LeRoy DeFoe, TEK int., 2001; Myrtle Gauthier, TEK int., 2000; Raymond J. Larson Jr., TEK int., 2001). Joseph M. Rose (TEK int., 2000) and Joseph Duffy (TEK int., 2001) remembered that, when they were young, fires occurred every five or six years. At that time, fire was both accidental and a commonly used "tool" to clear the land.

#### **Management Recommendations: Western Scientific Knowledge**

Rural communities, once dependent on timber extraction, have been encouraged to diversify their economic base in a variety of ways including the gathering of wild plants for commercial purposes. Scientists have questioned the encouragement of this activity, considering past timber exploitive activities. Continued wild plant gathering activities must be sustainable and not be the cause of ecosystem degradation (Vance 2002).

The formulation of policies and management plans to ensure sustainability and protect ecosystem health requires adequate inventory and monitoring. Necessary information to be documented includes the location, amount, quality, and accessibility of targeted wild plants. In addition, enhancement and protection requirements need to be determined (Kerns et al. 2002). Vance (2002) emphasized the need to broaden data gathering to ensure the sustainability and protection of the affected ecosystems.

Some scientists have recognized the value of TEK to identify gathering practices that promote sustainability. In the past, science-based management has opposed the use of TEK. However, recent shifts in scientific theories that have incorporated new concepts (including non-linear dynamics, disturbance dependency and uncertainty, inter-specific complexity, and human-resource interactions) have opened new channels of communication between scientists and TEK practioners (Davidson-Hunt and Berkes 2001). An increasing number of scientists now recommend the integration of TEK and science-based management to ensure sustainable wild plant gathering.

Most scientists recommend the continued study of the effects of pollutants. For example, the interaction of multiple pollutants may have serious consequences regarding

the susceptibility to disease by wild plants, but little is known regarding this issue (Manning and Tiedemann 1995). In addition, all plants respond differently to pollutants; some are likely to suffer extensive effects. However, scientists have not yet determined which species appear to be most sensitive. Also, the effects on wild plants by one pollutant could modify the effects of toxicity from other pollutants. This complexity must be better understood in order to provide appropriate recommendations for regulating atmospheric pollutants (Herzfeld et al. 1986).

Forest fragmentation resulting from past land use policies has prompted scientists to suggest management alternatives designed to increase contiguous acreage of old growth forest. Timber harvests should be discouraged within areas that already or potentially exhibit characteristics of old growth. In addition, all plant communities should be protected with enough large areas to allow the continuation of natural processes (Crow et al. 1993).

Pollinators should be protected from the impacts of forest fragmentation and chemical spraying. Kevan (1999) asserts that pollinators are a “bellwether for environmental stress.” He suggests that areas should be set aside to encourage the foraging and nesting of pollinators. More studies need to be conducted to determine all the various environmental conditions that will best ensure a high diversity of pollinators.

When feasible, fire should be used to maintain plant communities adapted to this type of disturbance. Other management activities may be employed to mimic fire. However, these alternative activities often fail to provide the necessary conditions to protect the integrity of fire-maintained communities. For example, clearcuts cause different effects to the soil and soil organisms (Crow et al. 1993). Prescribed fire has been used successfully as a method to restore pine barrens in northwestern Wisconsin. The USDA Forest Service continues to monitor these burns to determine the optimal frequency and intensity to best mimic natural conditions (Parker 1995).

Exotic species must be controlled and prevented from spreading. Recently, 17 United States government agencies entered into a Memorandum of Understanding and formed the Federal Interagency Committee for Management of Noxious and Exotic Weeds. This committee developed three national goals, based on recommendations formulated from past scientific studies, to address the threat of exotic species. The first goal highlights effective prevention and entails the interception of exotic species into the United States, inventory and monitoring for early detection, improved coordination between state and federal agencies to ensure compliance with laws and regulations, and expanded use of native plant species for ornamental and conservation purposes.

The second goal highlights effective control including the planning and determination of priorities, implementation of integrated pest management, and eradication of small infestations and control of expansive infestations. The third goal concentrates on effective restoration, specifically two sub goals: 1) the development and implementation of effective restoration methods and procedures for exotic plant degraded

area; and 2) promoting stewardship activities that will keep lands and waters free from invasive plants.

### **Integration of TEK and Western Scientific Knowledge**

Recommendations by tribal elders focused largely on harvest activities and taking care of wild plants. If people show respect for the natural world and use proper harvest techniques, as taught by elders and others, wild plants will continue to thrive. The elders also recognized the important role of fire.

Recommendations by western scientists focused on acquiring more understanding of the natural world and the effects of human activities. Knowing the conditions that favor the growth and survivorship of wild plants hopefully will encourage better management practices. Identifying the effects of human activities hopefully will provide the guidelines and policies necessary to protect wild plants from disastrous consequences. Furthermore, management practices currently suggested by western scientists often encourage the return of natural resources to approximate the conditions existing before Euro-American settlement.

An attitude of respect and an understanding that we (humans and other beings) are all related, permeate Anishinaabe TEK. Western science relies on experimentation, objective observation, and critical thinking. With the ability of humans to either decimate or protect the natural world, both TEK and western science provide necessary tools for making responsible decisions regarding future land use policies.

### **ACKNOWLEDGMENTS**

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Table 1. Date, location and documentation for TEK interviews.

DATE	LOCATION	TRANSCRIPTS	VIDEO	AUDIO	NOTES
7-23-00	Keweenaw Bay, MI	no	no	no	yes
7-24-00	Lac du Flambeau, WI	yes	yes	yes	yes
7-25-00	Lac Courte Oreilles, WI	yes	yes	yes	yes
8-4-00	Bay Mills, MI	yes	yes	yes	yes
9-13-00	Lac Vieux Desert, MI	yes	yes	yes	yes
9-29-00	Keweenaw Bay, MI	yes	yes	yes	yes
10-4-00	Lac Vieux Desert, MI	yes	yes	yes	yes
11-27-00	Lac du Flambeau, WI	yes	yes	no	yes
11-28-00	Lac Courte Oreilles, WI	yes	yes	no	yes
12-4-00	Lac Courte Oreilles, WI	yes	yes	missing	yes
12-4-00	Lac du Flambeau, WI	yes	yes	yes	yes
12-13-00	Bad River, WI	yes	yes	yes	yes
12-21-00	Bay Mills, MI	yes	yes	yes	yes
1-4-01	Red Cliff, WI	yes	yes	yes	yes
1-9-00	Mole Lake, WI	yes	yes	yes	yes
1-24-01	Fond du Lac – Sawyer, MN	no	no	no	yes
1-24-01	Fond du Lac – Sawyer, MN	no	no	no	yes
1-24-01	Fond du Lac – Cloquet, MN	yes	yes	yes	yes
1-25-01	Fond du Lac – Cloquet, MN	yes	yes	yes	yes
1-25-01	Fond du Lac – Cloquet, MN	yes	yes	yes	yes
1-25-01	Fond du Lac – Cloquet, MN	yes	yes	yes	yes
1-26-01	Fond du Lac – Cloquet, MN	yes	yes	yes	yes
1-26-01	Fond du Lac – Sawyer, MN	yes	yes	yes	yes
1-29-01	Bad River, WI	yes	yes	yes	yes
2-5-01	Red Cliff, WI	yes	yes	yes	yes

2-9-01	Lac du Flambeau, WI	yes	yes	yes	yes
2-12-01	Mole Lake, WI	yes	yes	yes	yes
2-13-01	Lac du Flambeau, WI - GLITC	yes	yes	yes	yes
2-23-01	Mille Lacs - Isle, MN	no	no	no	yes
3-6-01	St. Croix - Danbury, WI	yes	yes	yes	yes
3-10-01	Mole Lake, WI	yes	yes	no	yes
3-14-01	Bad River, WI	yes	yes	yes	yes
3-18-01	Red Cliff, WI	yes	yes	yes	yes
3-19-01	Lac Courte Oreilles, WI	yes	yes	no	yes
3-20-01	Lac Vieux Desert, MI	no	no	no	yes
3-22-01	Mille Lacs - Isle, MN	no	no	no	yes
3-28-01	Keweenaw Bay, MI	no	no	no	yes
3-29-01	Bay Mills, MI	no	no	no	yes
3-30-01	Lac du Flambeau, WI	no	no	no	yes

Table 2. University of Wisconsin-Madison online databases searched using keywords

Database	Location
ASFA3: Aquatic Pollution and Environmental Quality (1990-)	
Ecology Abstracts (1982-)	
EIS: Digests of Environmental Impact Statements (1985-)	<a href="http://www.library.wisc.edu:80/reslist/journals/journals-agri.html">http://www.library.wisc.edu:80/reslist/journals/journals-agri.html</a>
Environmental Engineering Abstracts (1990-)	
Health Safety Science Abstracts (1981-)	
Pollution Abstracts (1981-)	
Toxicology Abstracts (1990-)	
Water Resources Abstracts (1967-)	

Table 3. Listing threats to wild plants as identified by tribal elders.

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Chemical Spraying	Chemical Spray	Hazelnut	bagaaniminzh, -iig	Isabelle Chosa	7/23/00
Chemical Spraying	Chemical Spray	Rose Hips	ogin, -iig	Betty Kegg	2/23/01
Chemical Spraying	Chemical Spraying eliminated pin cherry	Pin Cherry	bawe'iminagaawinzh, iig	Hildred Thomas	3/22/02
Chemical Spraying	Farmers spraying pesticides			Charles Peter McGeshick	2/12/01
Chemical Spraying	Insecticide			Lac du Flambeau Elder	7/24/00
Chemical Spraying	Insecticide	Blackberry	odatagaagominagaawanzh, -iig	Doug Sam	2/23/01
Chemical Spraying	Insecticide	Wild Plum	bagwaji bagaanesan	Doug Sam	2/23/01
Chemical Spraying	Insecticide	Ferns	waagaag, -ans	Fond du Lac Elder	1/24/01
Chemical Spraying	Late 50's-60's road side spraying			Leslie Barney	1/25/01
Chemical Spraying	Pesticides			Pat Northrup	1/26/01
Chemical Spraying	Pesticides	Apple	mishiimin, -ag	Elizabeth M. Vetterneck	7/24/00
Chemical Spraying	Pesticides	Birch	wiigwaasi-mitig, -oog	Elizabeth M. Vetterneck	7/24/00
Chemical Spraying	Pesticides	Blackberry	odatagaagominagaawanzh, -iig	Elizabeth M. Vetterneck	7/24/00
Chemical Spraying	Pesticides	Blackberry	odatagaagominagaawanzh, -iig	George W. Brown Jr.	7/24/00
Chemical Spraying	Pesticides	Blueberry	miin (an)	Florence Greensky	1/24/01
Chemical Spraying	Pesticides	Blueberry	miin (an)	Elizabeth M. Vetterneck	7/24/00
Chemical Spraying	Pesticides	Blueberry	miin (an)	George W. Brown Jr.	7/24/00
Chemical Spraying	Pesticides	Cherry		George W. Brown Jr.	7/24/00
Chemical Spraying	Pesticides	Choke Cherry	asasawcminagaawanzh, -iig	Elizabeth M. Vetterneck	7/24/00

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Chemical Spraying	Pesticides	Choke Cherry	asasaweminagaawanzh, -iig	Constance T. Lang	2/12/01
Chemical Spraying	Pesticides	Choke Cherry	asasaweminagaawanzh, -iig	Loretta H. Dietzler	2/12/01
Chemical Spraying	Pesticides	Corn	mandaamin, -ag	George W. Brown Jr.	7/24/00
Chemical Spraying	Pesticides	Crabapple	mishiinminesan	Florence Greensky	1/24/01
Chemical Spraying	Pesticides	Raspberry	miskomin, -an	Elizabeth M. Vetterneck	7/24/00
Chemical Spraying	Pesticides	Raspberry	miskomin, -an	George W. Brown Jr.	7/24/00
Chemical Spraying	Pesticides	Strawberry	ode'imin, -an	Elizabeth M. Vetterneck	7/24/00
Chemical Spraying	Pesticides	Strawberry	ode'imin, -an	George W. Brown Jr.	7/24/00
Chemical Spraying	Pesticides	Sugar Maple	iminaatig, -oog	Marccila Beson	7/24/00
Chemical Spraying	Pesticides	Sumac	apaakwaanaatig, -oog	George W. Brown Jr.	11/27/00
Chemical Spraying	Pesticides	Sumac	apaakwaanaatig, -oog	George W. Brown Jr.	7/24/00
Chemical Spraying	Pesticides	Wild Plum	bagwaji bagaanesan	Elizabeth M. Vetterneck	7/24/00
Chemical Spraying	Pesticides	Wild Plum	bagwaji bagaanesan	George W. Brown Jr.	7/24/00
Chemical Spraying	Pesticides	Wild Rice	manoomin	Elizabeth M. Vetterneck	7/24/00
Chemical Spraying	Pesticides	Wild Rice	manoomin	George W. Brown Jr.	7/24/00
Chemical Spraying	Pesticides	Wintergreen	wiinisiibag	Elizabeth M. Vetterneck	7/24/00
Chemical Spraying	Roadside spraying	Blackberry	odatagaagominagaawanzh, -iig	Corrine E. Wick	1/26/01
Chemical Spraying	Roadside spraying	Blackberry	odatagaagominagaawanzh, -iig	Loretta H. Dietzler	2/13/01
Chemical Spraying	Roadside spraying	Choke Cherry	asasaweminagaawanzh, -iig	Hildred Thomas	3/6/01
Chemical Spraying	Roadside spraying	Raspberry	miskomin, -an	Loretta H. Dietzler	1/9/01

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Chemical Spraying	Roadside spraying	Sage	mashkodewashk	Betty Kegg	2/23/01
Chemical Spraying	Spraying			Joyce Einertson	2/13/01
Chemical Spraying	Spraying			Loretta H. Dietzler	2/13/01
Chemical Spraying	Spraying	Berries		Robert Diver	1/25/01
Chemical Spraying	Spraying	Blueberry	miin (an)	Darrell Kegg	2/23/01
Chemical Spraying	Spraying	Hazelnut	bagaaniminzh, -iig	Florence Greensky	1/24/01
Chemical Spraying	Spraying	Pink Cherries		Betty Kegg	2/23/01
Chemical Spraying	Spraying	Raspberry	miskomin, -an	Darrell Kegg	2/23/01
Chemical Spraying	Spraying	Sticky Greene Berries	zhaaboomin, -ag	Betty Kegg	2/23/01
Chemical Spraying	Spraying	Wild Rice	manoomin	James D. White Sr.	2/23/01
Climate Change	Climate Change			Bob Bassett	1/25/01
Climate Change	Climate Change			Les Northrup	1/25/01
Climate Change	Climate Change			Randy Wise	1/26/01
Climate Change	Climate Change			Rose Tainter	7/25/00
Climate Change	Precipitation Changes			Randy Wise	1/26/01
Climate Change	Weather	High-Bush Cranberry	aniibiimin, -an	Fond du Lac Elder	1/24/01
Commercialization	Commercialization of wild rice	Wild Rice	manoomin	Arnold Bigboy Sr.	1/29/01
Competing vegetation	Arrowhead	Wild Rice	manoomin	Jim Northrup	1/24/01
Competing vegetation	Arrowhead	Wild Rice	manoomin	Pat Northrup	1/26/01
Competing vegetation	Birch shaded from other trees	Birch	wiigwaasi-mitig, -oog	Clifford Parish Sr.	8/4/00

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Competing vegetation	Increase in weeds in Lac Vieux Desert	Wild Rice	manoomin	Ruth J. Antone	10/4/00
Competing vegetation	Lily pads choking out wild rice	Wild Rice	manoomin	Harold Crowe	1/29/01
Competing vegetation	More arrowhead	Wild Rice	manoomin	Harold Crowe	1/29/01
Competing vegetation	More lily pads	Wild Rice	manoomin	Harold Crowe	1/29/01
Dams	Dams	Wild Rice	manoomin	Russell Boyd	2/23/01
Development	ATV trails			Lac du Flambeau Elder	7/24/00
Development	Brushing alongside roads	Hazelnut	bagaaniminzh, -iig	Ruth J. Antone	2/13/01
Development	Building Houses	Gooseberry	zhaaboomin, -ag	Myrtle Gauthier	7/23/00
Development	Casino	Kinnickinnick	miskwaabimizh, -iig	Lac du Flambeau Elder	
Development	Construction			Lac du Flambeau Elder	7/24/00
Development	Construction	Apple	mishiimin, -ag	Elizabeth M. Vetterneck	7/24/00
Development	Construction	Birch	wiigwaasi-mitig, -oog	Elizabeth M. Vetterneck	7/24/00
Development	Construction	Blackberry	odatagaagominagaawanzh, -iig	Virgil Loonsfoot	7/23/00
Development	Construction	Blackberry	odatagaagominagaawanzh, -iig	Elizabeth M. Vetterneck	7/24/00
Development	Construction	Blueberry	miin (an)	Elizabeth M. Vetterneck	7/24/00
Development	Construction	Choke Cherry	asaweminagaawanzh, -iig	Elizabeth M. Vetterneck	7/24/00
Development	Construction	Hazelnut	bagaaniminzh, -iig	Isabelle Chosa	7/23/00
Development	Construction	Pin Cherry	bawa' iminaan	Barbara Mantilla	7/23/00
Development	Construction	Raspberry	miskomin, -an	Elizabeth M. Vetterneck	7/24/00
Development	Construction	Strawberry	ode' imin, -an	Elizabeth M. Vetterneck	7/24/00
Development	Construction	Wild Plum	bagwaji bagaanesan	Elizabeth M. Vetterneck	7/24/00
Development	Construction	Wild Rice	manoomin	Elizabeth M. Vetterneck	7/24/00

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Development	Construction	Wintergreen	wiinisiibag	Elizabeth M. Vetterneck	7/24/00
Development	Development			Joseph Duffy	2/5/01
Development	Development	Berries		Les Northrup	1/25/01
Development	Development	Berries		Loretta Martineau	1/25/01
Development	Development	Blueberry	miin (an)	Lac Vieux Desert Elder	10/4/00
Development	Development	Cranberry	mashkiigimin, -ag	Leo LaFemier	1/4/01
Development	Development	Currant	zhaaboomin, -ag	Don Wiessen	1/26/01
Development	Development	Ferns	waagaag, -ans	Jim Northrup	1/24/01
Development	Development	Grass	mashkosiw	Les Northrup	1/25/01
Development	Development	Kinnickinnick	miskwaabiimizh, -iig	Lac du Flambeau Elder	
Development	Development	White Birch	wiigwaasi-mitig, -oog	Don Wiessen	1/26/01
Development	Development	Mint	namewaskoonzh	Don Wiessen	1/26/01
Development	Development	Wild Rice	manoomin	Don Wiessen	1/26/01
Development	Dredging of river channel	Wild Rice	manoomin	Sylvia Cloud-Parisien	4/16/01
Development	Freeway	Horseradish		Margaret Ojibway	1/24/01
Development	Gas Lines	Wild Red Currant	zhaaboomin, -ag	Isabelle Chosa	7/23/00
Development	HUD Development	Wild Bergamont	sasap-kwanins	Velma McGeshick-Landru	2/12/01
Development	Houses built on gathering area	Hawthorn	minensagaawanzh, -iig	Elizabeth Dearbin	3/6/01
Development	Housing	Hazelnut	bagaaniminzh, -iig	Marcella Beson	7/24/00
Development	Housing	Juneberry	gozigwaakomin, -ag	Elmer J. LeBlanc	8/4/00
Development	Housing built where sugarbush was	Sugar Maple	ininaatig, -oog	Helen Smith	10/4/00
Development	Military Killed Them	Sand Cherry	sewa'komin	Don Wiessen	1/26/01
Development	Natural Gas Lines	Choke Cherry	asasaweminagaawanzh, -iig	Virgil Loonsfoot	7/23/00
Development	Natural Gas Lines	Pigweed		Barbara Mantilla	7/23/00
Development	New Roads	Arbutus		Hildred Thomas	3/6/01
Development	Over population	Choke Cherry	asasaweminagaawanzh, -iig	Doug Sam	2/23/01

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Development	Pavement	Hazelnut	bagaaniminzh, -iig	Ruth J. Antone	2/13/01
Development	People damaging tree	Apple	mishiimin, -ag	Loretta H. Dietzler	2/12/01
Development	People living there	Apple	mishiimin, -ag	Don Wiessen	1/26/01
Development	People, housing development			Ray A. McGeshick Sr.	2/12/01
Development	Pipelines			Wanda Pellerin	1/25/01
Development	Plowed over	Sweet Grass	wiingashk, -oon	Lac du Flambeau Elder	
Development	Plows			Mary E. Davis	1/25/01
Development	Power Lines	Pin Cherry	bawa' iminaan	Myrtle Gauthier	7/23/00
Development	Power Lines	Pin Cherry	bawa' iminaan	Virgil Loonsfoot	7/23/00
Development	Power Lines	Wild Cherries		Myrtle Gauthier	7/23/00
Development	Power Lines	Wintergreen	wiisiibag	Isabelle Chosa	7/23/00
Development	Recreational Use	Wild Rice	manoomin	Jim Northrup	1/24/01
Development	Road Building	Blueberry	miin (an)	Leona Ledbetter	12/4/00
Development	Road Construction			Delia Moreland	1/25/01
Development	Road Construction	Hazelnut	bagaaniminzh, -iig	Geraldine Parish	8/4/00
Development	Road Construction-Culverts			Ferdinand Martineau	1/25/01
Development	Road construction destroyed patch	Sweet Grass	wiingashk, -oon	Frank Montano	2/5/01
Development	Roads	Diamond Willow	oziisigobimizh, -iig	Jim Northrup	1/24/01
Development	Roads	Ferns	waagaag, -ans	Jim Northrup	1/24/01
Development	Roads	Green Willow	oziisigobimizh, -iig	Jim Northrup	1/24/01
Development	Roads	Red Willow	miskwaabiimizh, -iig	Jim Northrup	1/24/01
Development	Roadside brushing	Berries		Arnold Bigboy Sr.	1/29/01
Development	Snow Plowing			Lac du Flambeau Elder	7/24/00
Development	Snowplow	Sugar Maple	inaatig, -oog	Marcella Beson	7/24/00
Development	Too many people moved in	Pin Cherry	bawa' iminaan	Don Wiessen	1/26/01
Development	Tribal center built on harvest area	Strawberry	ode' imin, -an	Lucy Dewing	1/26/01

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Development	Urban Development	Blueberry	miin (an)	Elmer J. LeBlanc	8/4/00
Development	Urban Development	Hazelnut	bagaaninminzh, -iig	Elmer J. LeBlanc	8/4/00
Development	Urban Development	Strawberry	ode' imin, -an	Elmer J. LeBlanc	8/4/00
Development	Urban Development	Sugar Maple	aninaatig, -oog	Elmer J. LeBlanc	8/4/00
Development	Urban Development	Sweet Grass	wiingashk, -oon	Elmer J. LeBlanc	8/4/00
Development	Urban Development	White Cedar	giizhik, -ag	Elmer J. LeBlanc	8/4/00
Development	Urban Development	Wild Apple	mishiimin, -ag	Elmer J. LeBlanc	8/4/00
Development	Urban growth destroying harvest areas			Corrine E. Wick	1/26/01
Disease	Disease	Choke Cherry	asasaweminagaawanzh, -iig	Florence Greensky	1/24/01
Disease	Slime on Rice	Wild Rice	manoomin	Joseph J. Chosa	4/16/01
Ducks	Ducks	Wild Rice	manoomin	St. Croix Elder	3/6/01
Ecology Changes	Change to Landscape	Birch	wiigwaasi-mitig, -oog	Rebecca Munz	8/4/00
Ecology Changes	Ecology Changes	Arrowhead	waabiziipin	Margaret Ojibway	1/24/01
Ecology Changes	Ecology Changes	Bear Nuts	bagaaninminzh, -iig	Margaret Ojibway	1/24/01
Ecology Changes	Ecology Changes	Cowslip	waabigoniin	Margaret Ojibway	1/24/01
Ecology Changes	Ecology Changes	Dandelion	doodooshaaboojiibik	Margaret Ojibway	1/24/01
Ecology Changes	Ecology Changes	Labrador Tea	maskigobag	Margaret Ojibway	1/24/01
Ecology Changes	Ecology Changes	Milkweed	shaaboosigan	Margaret Ojibway	1/24/01
Ecology Changes	Ecology Changes	Wild Asparagus		Margaret Ojibway	1/24/01
Ecology Changes	Ecology Changes	Wild Ginger	namepin	Margaret Ojibway	1/24/01
Ecology Changes	Land Conditions	Choke Cherry	asasaweminagaawanzh, -iig	Doug Sam	2/23/01
Ecology Changes	Need other woods	Wild Plum	bagwaji bagaanesan	Rebecca Munz	8/4/00
Eradication	Eradication of Gooseberry	Skunkweed	zhaaboomin, -ag	Joseph M. Rose	12/13/00

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Exotic species	This plant is harming Kakagon Sloughs	Purple Loosestrife		Clarence Crowe	1/29/01
Exotic species	This plant is harming Kakagon Sloughs	Purple Loosestrife		Harold Crowe	1/29/01
Fewer predators	Fewer blackbirds to eat wonns	Wild Rice	manoomin	Harold Crowe	12/13/00
Fewer predators	Lack Of Black Birds	Wild Rice	manoomin	Clarence Crowe	12/13/00
Fewer predators	People killing blackbirds	Wild Rice	manoomin	Robert Powless Sr.	1/29/01
Fire	Fire	Birch	wiigwaasi-mitig, -oog	Leonard Sam	2/23/01
Fire	Fire	Blackberry	odatagaagominagaawanzh, -iig	Rebecca Munz	8/4/00
Fire	Fire	Blueberry	miin (an)	Clifford Parish Sr.	8/4/00
Fire	Fire	Blueberry	miin (an)	Isabelle Chosa	9/29/00
Fire	Fire	Blueberry	miin (an)	Myrtle Gauthier	7/23/00
Fire	Fire	Currant	zhaaboomin, -ag	Don Wiessen	1/26/01
Fire	Fire	Gooseberry	zhaaboomin, -ag	Clifford Parish Sr.	8/4/00
Fire	Fire	White Birch	wiigwaasi-mitig, -oog	Don Wiessen	1/26/01
Fire	Fire	Wild Grape	bagwaj zhoomin, -an	Betty Kegg	2/23/01
Fire	Fire	Wintergreen	wiinisiibag	Virgil Loonsfoot	7/23/00
Forest decline	Birch are dying off	Paper Birch	wiigwaasi-mitig, -oog	Ray A. McGeshick Sr.	2/12/01
Forest decline	Birch are dying off	Paper Birch	wiigwaasi-mitig, -oog	Hildred Thomas	3/6/01
Forest decline	Birch are dying off	Paper Birch	wiigwaasi-mitig, -oog	Ruth Holmes	3/6/01
Forest decline	Birch dying, Yellow Birch almost extinct	Birch	wiigwaasi-mitig, -oog	Rose Tainter	7/25/00
Forest decline	Birch is dying	Birch	wiigwaasi-mitig, -oog	Bob Bassett	1/25/01
Fungus	Black Smut growing on plants	Choke Cherry	asasaweminagaawanzh, -iig	Myrtle Soukkala	1/26/01
Fungus	Fungus	Birch	wiigwaasi-mitig, -oog	Leonard Sam	2/23/01
Fungus	Fungus	White Cedar	giizhik, -ag	Leonard Sam	2/23/01
Fungus	Parasites	Birch	wiigwaasi-mitig, -oog	Joseph J. Chosa	7/24/00
Fungus	Parasites	White Birch	wiigwaasi-mitig, -oog	Joseph J. Chosa	12/4/00
Improper harvest	Destroyed by digging up	Rhubarb	zhiiwibag	Loretta H. Dietzler	2/13/01

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Improper harvest	Harvesting too early	Wild Rice	manoomin	Jean Songetay	3/6/01
Improper harvest	Harvesting too soon	Wild Rice	manoomin	Florence Greensky	1/24/01
Improper harvest	Improper Beaver Harvest	Wild Rice	manoomin	Corrine E. Wick	1/24/01
Improper harvest	Improper Harvest	Wild Rice	manoomin	Leroy Defoe	1/25/01
Improper harvest	Inexperienced ricers and commercial ricers	Wild Rice	manoomin	Robert Powless Sr.	1/29/01
Improper harvest	Opening Dates	Wild Rice	manoomin	Joseph J. Chosa	4/16/01
Improper harvest	Over Harvest	Hazelnut	bagaaniminzh, -iig	Elmer J. LeBlanc	8/4/00
Improper harvest	Over Picked	Sweet Grass	wiingashk, -oon	Fond du Lac Elder	
Improper harvest	Over Picking	Sweet Grass	wiingashk, -oon	Rebecca Munz	8/4/00
Improper harvest	Overharvested	Ginseng	zhooniyaawijiibik	Hildred Thomas	3/22/02
Improper harvest	Overpicked	Wild Rice	manoomin	Doug Sam	2/23/01
Improper harvest	Too many ricers on a lake	Wild Rice	manoomin	Joseph J. Chosa	7/27/00
Improper harvest	Using Barbed Wire on Knockers	Wild Rice	manoomin	St. Croix Elder	3/6/01
Lack of caretakers	Lack of control over rice	Wild Rice	manoomin	Fond du Lac Elder	1/24/01
Lack of caretakers	Never Replanted	White Birch	wiigwaasi-mitig, -oog	Mary Louise Villiard	1/24/01
Lack of caretakers	No one picks them	Cranberry	mashkiigimin, -ag	Betty Kegg	2/23/01
Lack of caretakers	No one to care for them	Hazelnut	bagaaniminzh, -iig	Temperance E. Debe	1/24/01
Lack of caretakers	No one to care for them	Pin Cherry	bawa ' iminaan	Temperance E. Debe	1/24/01
Lack of caretakers	Not Being Used	Sugar Maple	aninaatig, -oog	Florence Greensky	1/24/01
Lack of caretakers	Not enough young people participating	Wild Rice	manoomin	Elizabeth Dearbin	3/6/01

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Lack of caretakers	Not many people pick anymore	Blueberry	miin (an)	Florence Greensky	1/24/01
Lack of caretakers	People not harvesting them, they'll go away	Choke Cherry	asasaweminagaawanzh, -iig	Hildred Thomas	3/6/01
Lack of caretakers	People not harvesting them, they'll go away	Paper Birch	wiigwaasi-mitig, -oog	Hildred Thomas	3/6/01
Lack of fire	Lack of Fire in National Forests			Joseph Duffy	1/4/01
Lack of fire	Lack of Fire, Not Enough Fire			Albert A. McGeshick	2/12/01
Lack of fire	No Fire	Berries		Wayne Tadgerson	8/4/00
Lack of fire	No Fire	Blueberry	miin (an)	Joseph Duffy	2/5/01
Lack of fire	No Fire	Blueberry	miin (an)	Judy Toppings	2/23/01
Lack of knowledge	Lack of Knowledge	White Cedar	giizhik, -ag	Corrine E. Wick	1/24/01
Lack of knowledge	Lack of knowledge			Robert Powless Sr.	1/29/01
Less plentiful	Decline in abundance	Wild Rice	manoomin	Joseph J. Chosa	4/16/01
Less plentiful	Harder to find due to roadside spraying	Blackberry	odatagaagominagaawanzh, -iig	Corrine E. Wick	1/26/01
Less plentiful	Haven't noticed any for a long time.	Hazelnut	bagaaniminzh, -iig	Deanna Baker	7/25/00
Less plentiful	Less Abundant	Pin Cherry	bawa' iminaan	Joyce Einertson	1/9/01
Less plentiful	Less Abundant	Pin Cherry	bawa' iminaan	Peter McGeshick Sr.	1/9/01
Less plentiful	Less common than before	Blackberry	odatagaagominagaawanzh, -iig	Alvina Abromowski	1/26/01
Less plentiful	Less common than before	Butternut	bagaanaak	John L Thomas	3/6/01
Less plentiful	Less common than before	Choke Cherry	asasaweminagaawanzh, -iig	Corrine E. Wick	1/26/01
Less plentiful	Less common than before	High-Bush Cranberry	aniibiimin, -an	Hildred Thomas	3/22/02
Less plentiful	No Growth	Juneberry	gozigwaakomin, -ag	Leonard Sam	2/23/01
Less plentiful	No Regeneration	Ironwood	maananoos, -ag	Leonard Sam	2/23/01
Less plentiful	No Regeneration	White Cedar	giizhik, -ag	Joseph Duffy	1/4/01
Less plentiful	Plants are there but, there are no nuts	Hazelnut	bagaaniminzh, -iig	William J. Houle	1/26/01

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Less plentiful	Rice on Perch Lake got thinner	Wild Rice	manoomin	Randy Wise	1/26/01
Less plentiful	Small/Immature plants	Bear Nuts	bagaaniminzh, -iig	Margaret Ojibway	1/24/01
Less plentiful	Small/Immature plants	Cowslip	waabigoniin	Margaret Ojibway	1/24/01
Less plentiful	Small/Immature plants	Dandelion	doodooshaaboojibik	Margaret Ojibway	1/24/01
Less plentiful	Small/Immature plants	Labrador Tea	maskigobag	Margaret Ojibway	1/24/01
Less plentiful	Small/Immature plants	Milkweed	shaaboosigan	Margaret Ojibway	1/24/01
Less plentiful	Small/Immature plants	White Cedar	giizhik, -ag	Margaret Ojibway	1/24/01
Less plentiful	Small/Immature plants	Wild Asparagus		Margaret Ojibway	1/24/01
Less plentiful	Small/Immature plants	Wild Onion	bagwaji zhigaagananzh	Margaret Ojibway	1/24/01
Less plentiful	Suitable habitat	Maple	aninaatig, -oog	Darrell Kegg	2/23/01
Less plentiful	Suitable habitat	Wild Grape	bagwaj zhoomin, -an	Darrell Kegg	2/23/01
Less plentiful	Used to be much more plentiful	Hazelnut	bagaaniminzh, -iig	Phyllis De Brot	7/25/00
Logging	Clearcut	Bear Nuts	bagaaniminzh, -iig	Margaret Ojibway	1/24/01
Logging	Clearcut	Cowslip	waabigoniin	Margaret Ojibway	1/24/01
Logging	Clearcut	Dandelion	doodooshaaboojibik	Margaret Ojibway	1/24/01
Logging	Clearcut	Milkweed	shaaboosigan	Margaret Ojibway	1/24/01
Logging	Clearcut	Raspberry	miskomin, -an	Donald Grey	11/27/00
Logging	Clearcut	White Cedar	giizhik, -ag	Margaret Ojibway	1/24/01
Logging	Clearcut	Wild Asparagus		Margaret Ojibway	1/24/01
Logging	Clearcut	Wild Onion	bagwaji zhigaagananzh	Margaret Ojibway	1/24/01
Logging	Clearcut with overgrowth	Blackberry	odatagaagominagaawanzh, -iig	Donald Grey	11/27/00
Logging	Clearcutting			Sylvia Cloud-Parisien	1/29/01
Logging	Clearcutting			William J. Houle	1/26/01
Logging	Clearcutting			Albert A. McGeshick	2/12/01
Logging	Clearcutting			Rose Tainter	7/25/00
Logging	Clearcutting	Basswood	wiigob-atig	Florence Greensky	1/24/01
Logging	Clearcutting	Basswood	wiigob-atig	Jim Northrup	1/24/01

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Logging	Clearcutting	Basswood	wiigob-atig	Pat Northrup	1/26/01
Logging	Clearcutting	Basswood	wiigob-atig	Kenneth G. Tainter Sr.	11/28/00
Logging	Clearcutting	Basswood	wiigob-atig	Loretta H. Dietzler	2/12/01
Logging	Clearcutting	Birch	wiigwaasi-mitig, -oog	George W. Brown Jr.	7/24/00
Logging	Clearcutting	Birch	wiigwaasi-mitig, -oog	Leonard Sam	2/23/01
Logging	Clearcutting	Blackberry	odatagaagominagaawanzh, -iig	Evelyn Benter	2/13/01
Logging	Clearcutting	Blueberry	miin (an)	Rebecca Munz	8/4/00
Logging	Clearcutting	Choke Cherry	asasaweminagaawanzh, -iig	Florence Greensky	1/24/01
Logging	Clearcutting	Diamond Willow	oziisigobimizh, -iig	Jim Northrup	1/24/01
Logging	Clearcutting	Ferns	waagaag, -ans	Doris A. Smith	1/24/01
Logging	Clearcutting	Green Willow	oziisigobimizh, -iig	Jim Northrup	1/24/01
Logging	Clearcutting	Ironwood	maananoos, -ag	Leonard Sam	2/23/01
Logging	Clearcutting	Juneberry	gozigwaakomin, -ag	Elmer J. LeBlanc	8/4/00
Logging	Clearcutting	May Hand		Doris A. Smith	1/24/01
Logging	Clearcutting	Oak	mitigomizh, -iig	Peter McGeshick III	1/9/01
Logging	Clearcutting	Pigweed		Barbara Mantilla	7/23/00
Logging	Clearcutting	Pigweed		Loretta H. Dietzler	2/13/01
Logging	Clearcutting	Pine	wakikaandag, -oog	George W. Brown Jr.	7/24/00
Logging	Clearcutting	Pink Cherries		Betty Kegg	2/23/01
Logging	Clearcutting	Red Willow	miskwaabiimizh, -iig	Jim Northrup	1/24/01
Logging	Clearcutting	Red Willow	miskwaabiimizh, -iig	Donald Grey	11/27/00
Logging	Clearcutting	Sugar Maple	ininaatig, -oog	Pat Northrup	1/26/01
Logging	Clearcutting	Sugar Maple	ininaatig, -oog	George W. Brown Jr.	7/24/00
Logging	Clearcutting	Sugar Maple	ininaatig, -oog	Loretta H. Dietzler	2/13/01
Logging	Clearcutting	White Birch	wiigwaasi-mitig, -oog	Jim Northrup	1/24/01
Logging	Clearcutting	White Birch	wiigwaasi-mitig, -oog	George W. Brown Jr.	12/4/00
Logging	Clearcutting	White Birch	wiigwaasi-mitig, -oog	Constance T. Lang	2/12/01

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Logging	Clearcutting	White Birch	wiigwaasi-mitig, -oog	Loretta H. Dietzler	2/12/01
Logging	Clearcutting	White Cedar	giizhik, -ag	Elmer J. LeBlanc	8/4/00
Logging	Clearcutting	White Cedar	giizhik, -ag	Jim Northrup	1/24/01
Logging	Clearcutting	White Cedar	giizhik, -ag	Constance T. Lang	2/12/01
Logging	Clearcutting	White Cedar	giizhik, -ag	Loretta H. Dietzler	2/12/01
Logging	Clearcutting	White Cedar	giizhik, -ag	Leonard Sam	2/23/01
Logging	Clearcutting	Wild Grape	bagwaj zhoomin, -an	Betty Kegg	2/23/01
Logging	Clearcutting	Wild Onion	bagwaji zhigaagananzh	Kenneth G. Tainter Sr.	7/25/00
Logging	Clearcutting	Wild Plum	bagwaji bagaanesan	Virgil Loonsfoot	7/23/00
Logging	Clearcutting affects nearby cedar stands	White Cedar	giizhik, -ag	Joseph M. Rose	4/16/01
Logging	Clearcutting, overgrowth	Black Raspberry	makade miskomin (an)	Leonard Sam	2/23/01
Logging	Clearcutting, overgrowth	Raspberry	miskomin, -an	Leonard Sam	2/23/01
Logging	Clearing	Blackberry	odatagaagominagaawanzh, -iig	Kenneth G. Tainter Sr.	7/25/00
Logging	Cutting	Aspen	azaadi, -wag	Raymond J. Larson Jr.	1/25/01
Logging	Cutting	Birch	wiigwaasi-mitig, -oog	Doris A. Smith	1/24/01
Logging	Cutting	Cattail	apakweshkway, -ag	Temperance E. Debe	1/24/01
Logging	Cutting	Currant	zhaaboomin, -ag	Don Wiessen	1/26/01
Logging	Cutting	Dandelion	doodooshaaboojiibik	Raymond J. Larson Jr.	1/25/01
Logging	Cutting	Pin Cherry	bawa' iminaan	Raymond J. Larson Jr.	1/25/01
Logging	Cutting	White Birch	wiigwaasi-mitig, -oog	Don Wiessen	1/26/01
Logging	Cutting	Wild Red Currant	zhaaboomin, -ag	Myrtle Gauthier	7/23/00
Logging	Cutting	Wintergreen	wiinisiibag	Myrtle Gauthier	7/23/00
Logging	Cutting, overgrowth	Juneberry	gozigwaakomin, -ag	Leonard Sam	2/23/01
Logging	Excessive logging	Jack Pine	okikaandag, -oog	Loretta H. Dietzler	2/13/01
Logging	Excessive logging	Mushroom	zhaskweedoons, -ag	Loretta H. Dietzler	2/13/01
Logging	Excessive logging	Onion	zhigaagawanzh, -iig	Loretta H. Dietzler	2/13/01

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Logging	Logging	Birch	wiigwaasi-mitig, -oog	Clifford Parish Sr.	8/4/00
Logging	Logging	Hazelnut	bagaaniminzh, -iig	Virgil Loonsfoot	7/23/00
Logging	Logging	Maple	aninaatig, -oog	Doug Sam	2/23/01
Logging	Logging	Red Pine	apakwanagemag	Joseph J. Chosa	12/4/00
Logging	Logging	Sugar Maple	ininaatig, -oog	Clifford Parish Sr.	8/4/00
Logging	Logging	Sugar Maple	ininaatig, -oog	Joseph J. Chosa	12/4/00
Logging	Logging	White Cedar	giizhik, -ag	Corrine E. Wick	1/24/01
Logging	Logging	White Cedar	giizhik, -ag	Myra J. Pitts	2/12/01
Logging	Logging	White Cedar	giizhik, ag	John L. Thomas	3-22-02
Logging	Logging	White Pine	zhingwaak, -wag	Joseph J. Chosa	7/24/00
Logging	Logging	Wild Plum	bagwaji bagaanesan	Barbara Mantilla	7/23/00
Logging	Logging	Wild Rice	manoomin	Constance T. Lang	2/12/01
Logging	Logging	Wild Rice	manoomin	Loretta H. Dietzler	2/12/01
Logging	Logging effects the spirits of the trees	Paper Birch	wiigwaasi-mitig, -oog	Richard Ackley Sr.	2/12/01
Logging	Over Cutting	Blueberry	miin (an)	Elmer J. LeBlanc	8/4/00
Logging	Over Cutting	Sugar Maple	ininaatig, -oog	Elmer J. LeBlanc	8/4/00
Logging	Over Cutting	Sweet Grass	wiingashk, -oon	Elmer J. LeBlanc	8/4/00
Logging	Over Cutting	Wild Apple	mishiimin, -ag	Elmer J. LeBlanc	8/4/00
Logging	Timber Harvesting	Oak	mitigomizh, -iig	Peter McGeshick III	1/9/01
Logging	Timber Harvesting	White Ash	baapaagimaak, -wag	Peter McGeshick III	1/9/01
Logging	Timber Harvesting	White Birch	wiigwaasi-mitig, -oog	Peter McGeshick III	1/9/01
Logging	Timber Harvesting	White Birch	wiigwaasi-mitig, -oog	Peter McGeshick III	1/9/01
Logging	Trees are logged before they reach a large diameter	White Birch	wiigwaasi-mitig, -oog	Joseph J. Chosa	7/27/00
Logging	Trees are logged before they reach a large diameter	White Birch	wiigwaasi-mitig, -oog	William Ackley	7/27/00
Mining	Changes in water from mine project	Wild Rice	manoomin	Peter McGeshick Jr.	2/12/01
Motor Boats	Boats	Wild Rice	manoomin	Leona Ledbetter	7/24/00

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Motor Boats	Motor Boats	Wild Rice	manoomin	Phyllis De Brot	7/25/00
Motor Boats	Motor Boats	Wild Rice	manoomin	Sylvia Cloud-Parisien	12/13/00
Motor Boats	Motor Boats	Wild Rice	manoomin	Robert A. VanZile Sr.	2/12/01
Motor Boats	Motor Boats cutting through the rice beds	Wild Rice	manoomin	Joseph J. Chosa	7/27/00
Motor Boats	Power boats	Wild Rice	manoomin	Deanna Baker	7/25/00
Musk rats	Musk rats	Wild Rice	manoomin	Betty M. Torgerud	3/6/01
Overgrowth	Arcas are overgrown	Berries		Darlene Kupsco	1/29/01
Overgrowth	Growing Over	Strawberry	ode'imin, -an	Judy Toppings	2/23/01
Overgrowth	Overgrowth	Basswood	wiigob-atig	Florence Greensky	1/24/01
Overgrowth	Overgrowth	Berries		Les Northrup	1/25/01
Overgrowth	Overgrowth	Blackberry	odatagaagominagaawanzh, -iig	Evelyn Benter	2/13/01
Overgrowth	Overgrowth	Blackberry	odatagaagominagaawanzh, -iig	Mille Laes Elder	2/23/01
Overgrowth	Overgrowth	Blueberry	miin (an)	Elmer J. LeBlanc	8/4/00
Overgrowth	Overgrowth	Blueberry	miin (an)	Florence Greensky	1/24/01
Overgrowth	Overgrowth	Blueberry	miin (an)	Raymond J. Larson Jr.	1/25/01
Overgrowth	Overgrowth	Choke Cherry	asaweminagaawanzh, -iig	Florence Greensky	1/24/01
Overgrowth	Overgrowth	Crabapple	mishiinminesan	Florence Greensky	1/24/01
Overgrowth	Overgrowth	Crabapple	mishiinminesan	Isabelle Chosa	9/29/00
Overgrowth	Overgrowth	Ferns	waagaag, -ans	Katherine Olson	1/24/01
Overgrowth	Overgrowth	Grass	mashkosiw	Les Northrup	1/25/01
Overgrowth	Overgrowth	Hazelnut	bagaaniminzh, -iig	Elmer J. LeBlanc	8/4/00
Overgrowth	Overgrowth	Hazelnut	bagaaniminzh, -iig	Temperance E. Debe	1/24/01
Overgrowth	Overgrowth	Morel	zhaskweedoons, -ag	Raymond J. Larson Jr.	1/25/01
Overgrowth	Overgrowth	Sugar Maple	ininaatig, -oog	Florence Greensky	1/24/01
Overgrowth	Overgrowth shading plants	Wild Plum	bagwaji bagaanesan	Joseph M. Rose	12/13/00
Overgrowth	Overgrowth, Fires	Blueberry	miin (an)	Leonard Sam	2/23/01

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Overgrowth	Overgrowth, Flooding	High-Bush Cranberry	aniibiimin, -an	Leonard Sam	2/23/01
Overgrowth	Overgrowth-brush	Blueberry	miin (an)	Ferdinand Martineau	1/25/01
Overgrowth	People moved in	Juneberry	gozigwaakomin, -ag	Don Wiessen	1/26/01
Overgrowth	Underbrush			Arnold Bigboy Sr.	1/29/01
Pests	Insect infestations	White Birch	wiigwaasi-mitig, -oog	Constance T. Lang	2/12/01
Pests	Insect infestations	White Birch	wiigwaasi-mitig, -oog	Loretta H. Dietzler	2/12/01
Pollinator Decline	Fewer butterflies			Corrine E. Wick	1/26/01
Pollinator Decline	Lack of bees, due to automobile collisions			Charles Peter McGeshick	2/12/01
Pollinator Decline	Lack of bees	Pin Cherry	bawa 'iminaan	Richard Ackley Sr.	1/9/01
Pollinator Decline	Loss of insects, fewer bees than there used to be			Donald Grey	12/4/00
Pollinator Decline	Pollinators (bees and butterflies) less common			Sylvia Cloud-Parisien	1/29/01
Pollution	Acid Rain			Randy Wise	1/26/01
Pollution	Acid Rain			William J. Houle	1/26/01
Pollution	Acid Rain			Lac du Flambeau Elder	7/24/00
Pollution	Acid Rain			Raymond Smith Sr.	10/4/00
Pollution	Acid Rain			Madeline Schreyer	2/5/01
Pollution	Acid Rain	Blackberry	odatagaagominagaawanzh, -iig	George W. Brown Jr.	11/27/00
Pollution	Acid Rain	Blueberry	miin (an)	George W. Brown Jr.	7/24/00
Pollution	Acid Rain	Cherry		George W. Brown Jr.	11/27/00
Pollution	Acid Rain	Cherry		George W. Brown Jr.	7/24/00
Pollution	Acid Rain	Choke Cherry	asasaweminagaawanzh, -iig	Fond du Lac Elder	1/24/01
Pollution	Acid Rain	Corn	mandaamin, -ag	George W. Brown Jr.	7/24/00

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Pollution	Acid Rain	Pin Cherry	bawa' iminaan	George W. Brown Jr.	12/4/00
Pollution	Acid Rain	Raspberry	miskomin, -an	George W. Brown Jr.	7/24/00
Pollution	Acid Rain	Strawberry	ode' imin, -an	George W. Brown Jr.	7/24/00
Pollution	Acid Rain	Sumac	apaakwaanaatig, -oog	George W. Brown Jr.	7/24/00
Pollution	Acid Rain	Wild Plum	bagwaji bagaanesan	George W. Brown Jr.	7/24/00
Pollution	Acid Rain	Wild Rice	manoomin	George W. Brown Jr.	7/24/00
Pollution	Air Pollution			Delia Moreland	1/25/01
Pollution	Changes in Acidity	Cattail	apakweshkway, -ag	Temperance E. Debe	1/24/01
Pollution	Chemicals	Wild Grape	bagwaj zhoomin, -an	Betty Kegg	2/23/01
Pollution	Farmland	Cranberry	mashkiigimin, -ag	Doug Sam	2/23/01
Pollution	Fertilizer	Wild Rice	manoomin	Mille Lacs Elder	2/23/01
Pollution	Industrial Emissions			Raymond J. Larson Jr.	1/25/01
Pollution	Oil on surface of water	Wild Rice	manoomin	Pat Northrup	1/26/01
Pollution	Oil runoff	High-Bush Cranberry	aniibimin, -an	Rita Nelson	2/13/01
Pollution	Ozone Layer			Randy Wise	1/26/01
Pollution	Pollution			Corrine E. Wick	1/26/01
Pollution	Pollution			Rose Tainter	7/25/00
Pollution	Pollution	Wild Rice	manoomin	Clarence Crowe	12/13/00
Pollution	Pollution	Wild Rice	manoomin	Corrine E. Wick	1/24/01
Pollution	Pollution	Wild Rice	manoomin	Russell Boyd	2/23/01
Pollution	Road Salt			Lac du Flambeau Elder	7/24/00
Pollution	Road Salt			Joyce Einertson	2/13/01
Pollution	Road Salt	Blackberry	odatagaagominagaawanzh, -iig	Deanna Baker	7/25/00
Pollution	Road Salt	Blueberry	miin (an)	Virgil Loonsfoot	7/23/00
Pollution	Road Salt	Blueberry	miin (an)	Deanna Baker	7/25/00

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Pollution	Road Salt	Hazelnut	bagaanininzh, -iig	Audrey Lyons	8/4/00
Pollution	Road Salt	High-Bush Cranberry	aniibiimin, -an	Rita Nelson	2/13/01
Pollution	Road Salt	Paper Birch	wiigwaasi-mitig, -oog	Ruth Holmes	3/6/01
Pollution	Road Salt	Sour Sabs		Myrtle Gauthier	7/23/00
Pollution	Road Salt	Tamarack	mashkligvaatig, -oog	Mille Lacs Elder	2/23/01
Pollution	Road Salt	Wild Plum	bagwaji bagaanesan	Barbara Mantilla	7/23/00
Pollution	Run Off	Cattail	apakweshkway, -ag	Temperance E. Debe	1/24/01
Pollution	Run off from chicken farms	Wild Rice	manoomin	Judy Toppings	2/23/01
Pollution	Waste	White Birch	wiigwaasi-mitig, -oog	Mary Louise Villiard	1/24/01
Pollution	Water Quality	Wild Rice	manoomin	Peter McGeshick III	1/9/01
Public Access	Availability of Ricing camps	Wild Rice	manoomin	Loretta H. Dietzler	2/12/01
Public Access	Conversion of county land to private			Peter McGeshick Jr.	2/12/01
Public Access	Lack of access due to private ownership			Charles Peter McGeshick	2/12/01
Public Access	Landowner	Blackberry	odatagaagominagaawanzh, -iig	Doug Sam	2/23/01
Public Access	Public Access			Hildred Thomas	3/6/01
Public Access	Public Access	Birch	wiigwaasi-mitig, -oog	St. Croix Elder	3/6/01
Snowmobiles	Snowmobiles			Lac du Flambeau Elder	7/24/00
Snowmobiles	Snowmobiles			Ruth Holmes	3/22/02
Water level changes	Dam	Wild Rice	manoomin	Helen Smith	10/4/00
Water level changes	Dam	Wild Rice	manoomin	Ruth J. Antone	10/4/00
Water level changes	Dam	Wild Rice	manoomin	Raymond Smith Sr.	10/4/00
Water level changes	Dam Flooded River-Killed Rice	Wild Rice	manoomin	Art Tainter	7/25/00

GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Water level changes	Dam at Lac Vieux Desert, killed cranberries	Cranberry	mashkiigimin, -ag	Rose Martin	2/13/01
Water level changes	Dam at Lac Vieux Desert, killed wild rice	Wild Rice	manoomin	Rose Martin	2/13/01
Water level changes	Damage to the water table			Albert A. McGeshick	2/12/01
Water level changes	Dams	Wild Rice	manoomin	Phyllis De Brot	7/25/00
Water level changes	Dams	Wild Rice	manoomin	Albert A. McGeshick	2/12/01
Water level changes	Dams	Wild Rice	manoomin	Robert A. VanZile Sr.	1/9/01
Water level changes	Dams	Wild Rice	manoomin	Darrell Kegg	2/23/01
Water level changes	Dams	Wild Rice	manoomin	Leonard Sam	2/23/01
Water level changes	Dams, Beaver Dams, Water level	Wild Rice	manoomin	Doug Sam	2/23/01
Water level changes	Drainage for farmland	Wild Rice	manoomin	William J. Houle	1/26/01
Water level changes	Drained	Wild Rice	manoomin	Jim Northrup	1/24/01
Water level changes	Flood	Cranberry	mashkiigimin, -ag	Betty Kegg	2/23/01
Water level changes	Flood	Cranberry	mashkiigimin, -ag	Darrell Kegg	2/23/01
Water level changes	Flood	Wild Plum	bagwaji bagaanesan	Barbara Mantilla	7/23/00
Water level changes	Flood, Lack of moisture	Cranberry	mashkiigimin, -ag	Doug Sam	2/23/01
Water level changes	Flood, Lack of moisture	Wild Plum	bagwaji bagaanesan	Doug Sam	2/23/01
Water level changes	Flood/Low Water	Wild Rice	manoomin	Florence Greensky	1/24/01
Water level changes	Flooding	Wild Rice	manoomin	Kenneth G. Tainter Sr.	7/25/00
Water level changes	Low Water	Wild Rice	manoomin	Raymond J. Larson Jr.	1/25/01
Water level changes	Low and High Water	Wild Rice	manoomin	William J. Houle	1/26/01

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GENERAL THREAT	SPECIFIC THREAT	COMMON NAME	OJIBWEMOWIN	ELDER	DATE
Water level changes	Too much water	Wild Rice	manoomin	Constance T. Lang	2/12/01
Water level changes	Too much water	Wild Rice	manoomin	Loretta H. Dietzler	2/12/01
Water level changes	Water level change	Wild Rice	manoomin	Ira A. Antone	10/4/00
Water level changes	Water level change	Wild Rice	manoomin	Ruth J. Antone	10/4/00
Water level changes	Water level change	Wild Rice	manoomin	Raymond Smith Sr.	10/4/00
Water level changes	Water level increases	Wild Rice	manoomin	Helen Smith	10/4/00

Table 4. Threats identified within the scientific literature.

<i>Threat</i>	<i>Source</i>
<b>Deer Herbivory</b>	Hough 1965; Anderson and Loucks 1979; Beals et al. 1960; Cornett et al. 2000; Frelich and Lorimer 1985; Van Deelen et al. 1998; Augustine and Frelich 1998; Miller et al. 1992; Balgooyen and Waller 1995
<b>Acid Deposition</b>	Lovett and Hubbell 1991; Tukey 1980; Glass and Loucks 1986; Lee and Weber 1979; Lovett 1994; Taylor et al. 1994; Blank et al. 1992; USEPA 1999
<b>Tropospheric Ozone</b>	Lovett 1994; Taylor et al. 1994; Blank et al. 1992; Manning and Tiedmann 1995; Krupa and Kickert 1989 Skelly 2000; Dickson et al. 2000
<b>Road Salt</b>	Fleck et al. 1988; Hall et al. 1972; Hofstra and Hall 1971; Lumis et al. 1976; Hutchinson and Olson 1967
<b>Exotic Species</b>	Stapanian et al. 1998; Drake et al. 1989; Hobbs and Humphries 1995; Cronk and Fuller 1995
<b>Ultraviolet-B Radiation</b>	Caldwell et al. 1989; Manning and Tiedmann 1995; Sullivan 1997; Rozema et al. 1997; Torabinejad et al. 1998; Huttunen et al. 1998
<b>Global Warming</b>	Davis 1989; Schneider 1989; Peters 1990; Ledig and Kitzmiller 1992; IPCC 1996; IPCC 1998
<b>Threats to Pollinators</b>	Spira 2001; Bond 1994; Kearns and Inouye 1997; Rathcke and Jules 1993; Buchmann and Nabhan 1996; Mustajarvi et al. 2001; Steffan-Dewenter and Tschardtke 1999; Kevan 1999; Batra 1995
<b>Overharvesting</b>	Nantel et al. 1996
<b>Logging</b>	Meier et al. 1995; Covington 1981; Hix and Barnes 1984
<b>Lack of Fire</b>	Loope and Anderton 1998; Ahlgren and Ahlgren 1983; Curtis 1959.
<b>Decrease in Coarse Woody Debris</b>	Simard et al. 1998; McComb and Lindenmayer 1999.

Table 5. Names of referenced species arranged alphabetically by English name

Ojibwemowin	English	Scientific Nomenclature
aniib	American elm	<i>Ulmus americana</i>
waabizipin	arrowhead	<i>Sagittaria latifolia</i> Willd.
azaadi, -wag	aspen	<i>Populus spp.</i>
zhingob, -iig	balsam fir	<i>Abies balsamea</i> L.
wiigob, -iig	basswood	<i>Tilia americana</i> L.
bagaaniminzh, -iig	bear nuts	<i>Corylus americana</i> Walter
migiziibag	big-leaf aster	<i>Aster macrophyllus</i>
wiigwaasi-mitig, -oog	birch	<i>Betula spp.</i>
ookweminagaawanzh, -iig	black cherry	<i>Prunus serotina</i> Ehrh.
makade miskomin -an	black raspberry	<i>Rubus occidentalis</i> L.
odatagaagominagaawanzh, -iig	blackberry	<i>Rubus allegheniensis</i> Porter ex L.f. Bailey
	blister rust	<i>Cronartium ribicola</i>
godotaagaans	blue-bead lily	<i>Clintonia borealis</i>
miinagaawanzh, -iig	blueberry	<i>Vaccinium angustifolium</i> Aiton
	buckthorn	<i>Rhamnus spp.</i>
bagaanaak	butternut	<i>Juglans cinerea</i> L.
ne 'bagandag'	Canada yew	<i>Taxus canadensis</i>
apakweshkway, -ag	cattail	<i>Typha latifolia</i> L.
asasaweminagaawanzh, -iig	choke cherry	<i>Prunus virginiana</i> L. var. <i>virginiana</i>
inashkiigimin, -ag	crabapple	<i>Malus coronaria</i> L. (Mill.)
inashkiigiminagaawanzh, -iin	cranberry	<i>Vaccinium macrocarpon</i> Aiton
doodooshaaboojiibik	dandelion	<i>Taraxacum officinale</i> Weber
	diamond willow	<i>Salix eriocephala</i> Michx.
	Dutch elm disease	<i>Anoplophora glabripennis</i>
kaakaagiwanzh	eastern hemlock	<i>Tsuga canadensis</i>
waagaag	ferns	various species
zhooniyaawijiibik	ginseng	<i>Panax quinquefolium</i>
zhaaboominagaawanzh, -iig	gooseberry	<i>Ribes americana</i> Mill.
bagaaniminzh, -iig	hazelnut	<i>Corylus cornuta</i> Marsh.
aniibiiminagaawanzh, -iig	high-bush cranberry	<i>Viburnum opulus</i> L. var. <i>americanum</i> Aiton
inaanoqns, -ag	ironwood	<i>Ostrya virginiana</i> Mill. K. Koch
okikaandag, -oog	jack pine	<i>Pinus banksiana</i> Lamb.
gozigwaakominagaawanzh, -iig	juneberry	<i>Amelanchier laevis</i> Wiegard
inaskigobag	Labrador tea	<i>Ledum groenlandicum</i> Oeder
	leafy spurge	<i>Euphorbia esula</i>
ininaatig, -oog	maple	<i>Acer spp.</i>
ogitebag	marsh marigold	<i>Caltha palustris</i>
shaaboosigan	milkweed	<i>Asclepias syriaca</i> L.
namewashkoonzh	mint	<i>Mentha arvensis</i> L. var. <i>canadensis</i> (L.) Kuntze
	morel	<i>Morchella spp.</i>
wazhashkwedoons, -ag	mushrooms	
mitigomizh, -iig	oak	<i>Quercus spp.</i>
wiigwaasi-mitig, -oog	paper birch	<i>Betula papyrifera</i> Marsh.
	pigweed	<i>Chenopodium album</i> L.
bawa'iminagaawanzh, -iig	pin cherry	<i>Prunus pensylvanica</i> L. f.

cigona'gan	princess pine	<i>Lycopodium obscurum</i> L.
	purple loosestrife	<i>Lythrum salicaria</i> L.
miskomin, -ag	raspberry	<i>Rubus idaeus</i> L.
mitigomizh	red oak	<i>Quercus rubra</i>
apakwanagemag	red pine	<i>Pinus resinosa</i> Ait.
miskwaabiimizh, -iig	red-osier dogwood	<i>Cornus stolonifera</i> Michx.
manoominikeshiinh	rice bird	<i>Rallus limicola</i> , <i>Fulica americana</i>
	rice worm	<i>Apamea apamiformis</i>
sewa'komin	sand cherry	<i>Prunus pumila</i> L.
	sea lamprey	<i>Petromyzon marinus</i>
neweia 'kwisink	sessile-leaved bellwort	<i>Uvularia sessilifolia</i>
waaboos	snowshoe hare	<i>Lepus americanus</i>
ode'immin, -an	strawberry	<i>Fragaria virginiana</i> Duchense
ininaatig, -oog	sugar maple	<i>Acer saccharum</i> Marsh.
apaakwaanaatig	sumac	<i>Rhus glabra</i> L.
wiikenth, -yag	sweet flag	<i>Acorus calamus</i>
wiingashk, -oon	sweet grass	<i>Hierochloe hirta</i> (Schränk) Borbas subsp. <i>arctica</i> (J.Presl) G.Wein.
mashkiigwaatig, -oog	tamarack	<i>Larix laricina</i> (DuRoi) Koch
minesagaawinzh	thornapple/ hawthorn	<i>Crataegus pedicellata</i> Sarg.
	trailing arbutus	<i>Epigaea repens</i> L.
baapaagimaak, -wag	white ash	<i>Fraxinus americana</i> L.
giizhik, -ag	white cedar	<i>Thuja occidentalis</i> L.
zhingwaak	white pine	<i>Pinus strobus</i>
gaawaandag	white spruce	<i>Picea glauca</i>
baushkindjibgwaun	white trillium	<i>Trillium grandiflorum</i>
waawaashkeshi	white-tailed deer	<i>Odocoileus virginianus</i>
	wild asparagus	<i>Asparagus officinalis</i> L.
sasap-kwanins	wild bergamont	<i>Monarda fistulosa</i> L.
miishijiiminagaawanzh, -iig	wild currant	<i>Ribes americana</i> Mill.
namepin	wild ginger	<i>Asarum canadense</i> L.
bagwaj zhoomin (an)	wild grape	<i>Vitis riparia</i> Michx.
bagwaaji zhigaagananzh	wild onion	<i>Allium stellatum</i> Ker Gawl.
bagwaaji bagaancesan	wild plum	<i>Prunus americana</i> Marsh.
manoomin	wild rice	<i>Zizania palustris</i> L.
bizhikiwiginiig	wild rose	<i>Rosa blanda</i> Ait.
maskodewashk	wild sage	<i>Artemisia ludoviciana</i> Nutt.
bebaamaabiig	wild sarsparilla	<i>Aralia nudicaulis</i>
oziisigobiminzh	willow	<i>Salix spp.</i>
wiinisiibag	wintergreen	<i>Gaultheria procumbens</i> L.
wiinizik, -oog	yellow birch	<i>Betula allegheniensis</i> Britton

Figure 1. Location of GLIFWC member tribes and boundaries of the ceded territories.

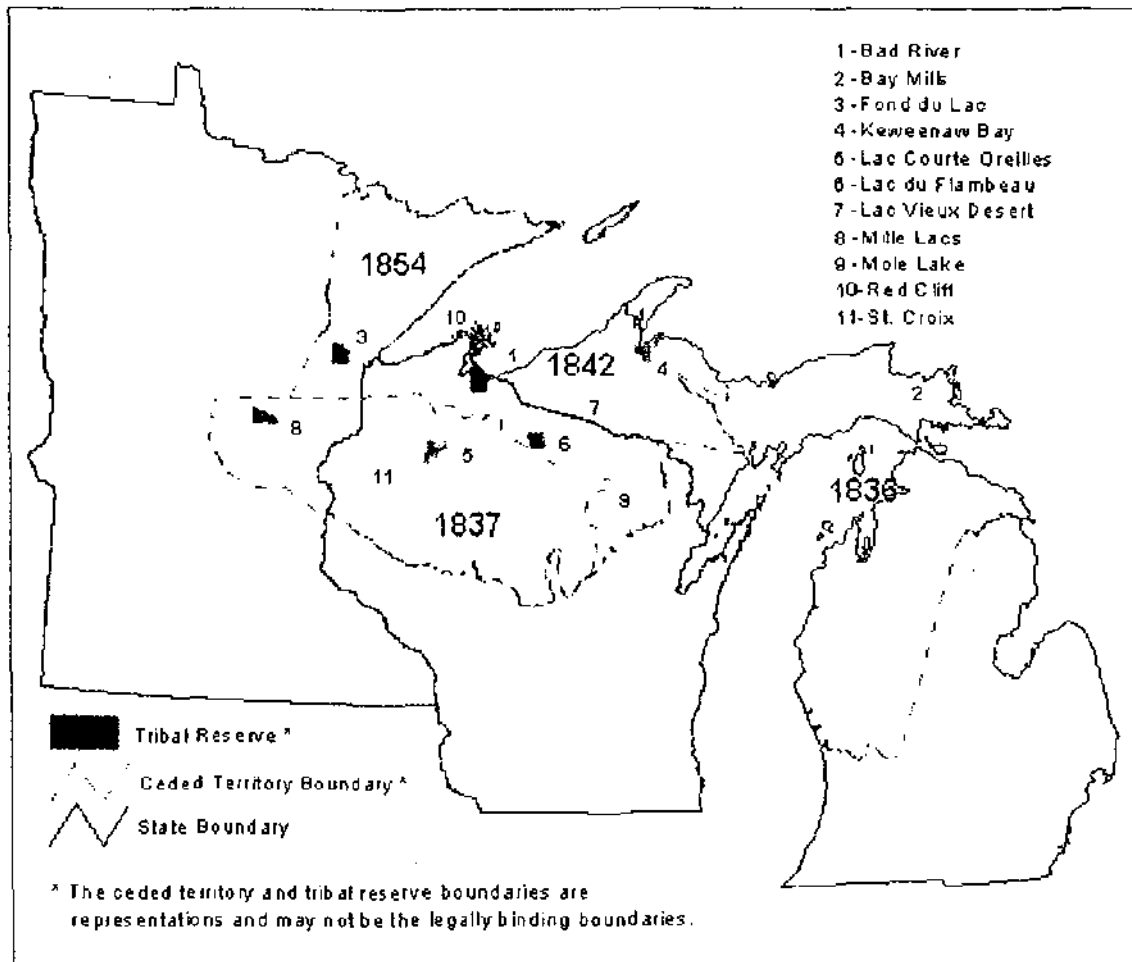


Figure 2. Locations of the NADP/NTN monitoring sites.

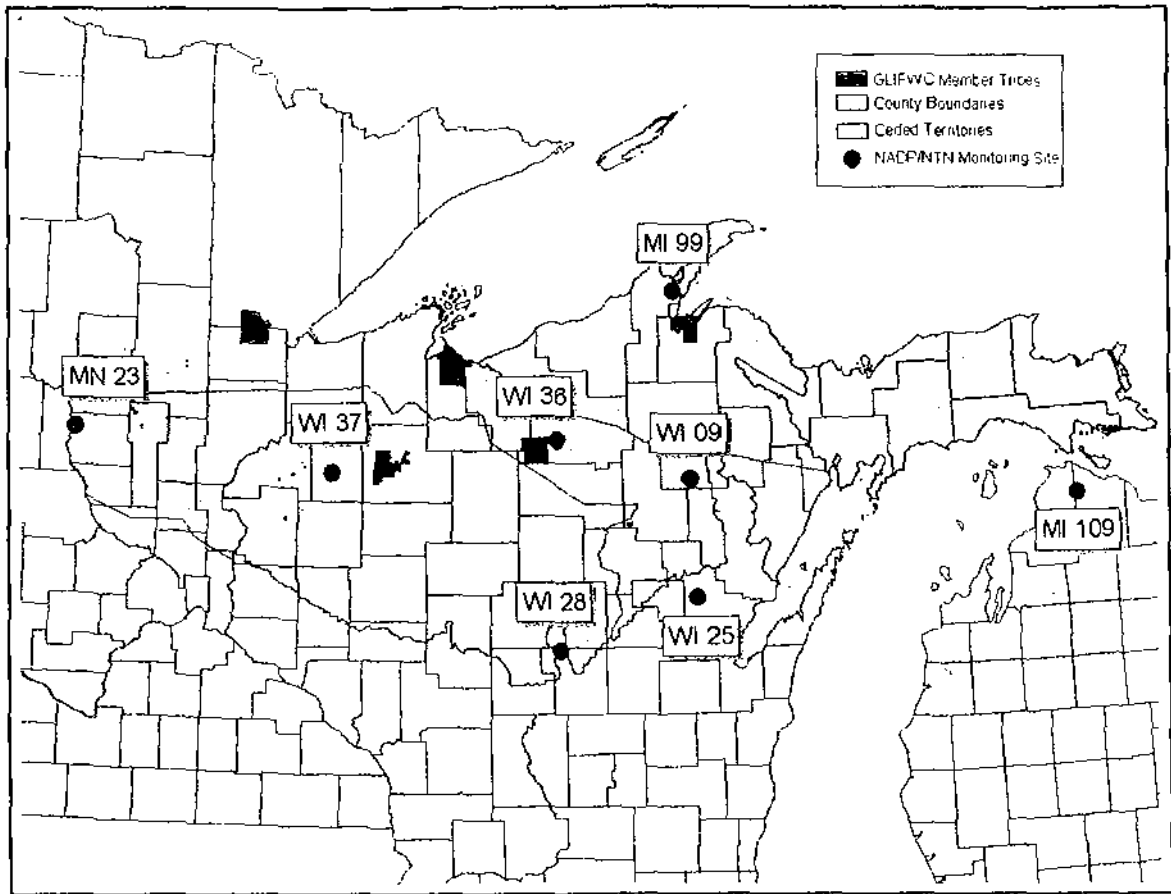


Figure 3. Acidity levels (pH) data from NADP/NTN monitoring sites.

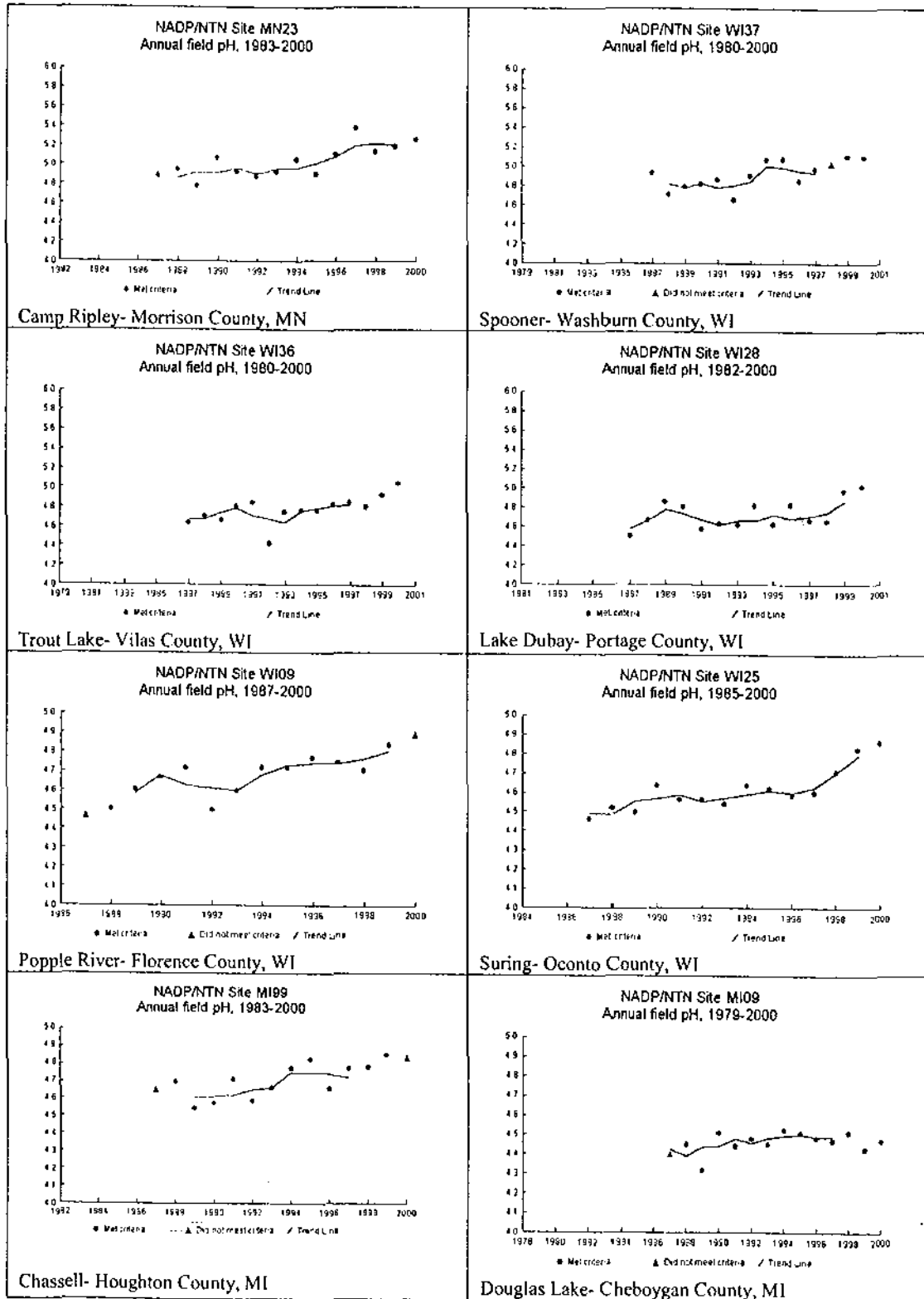
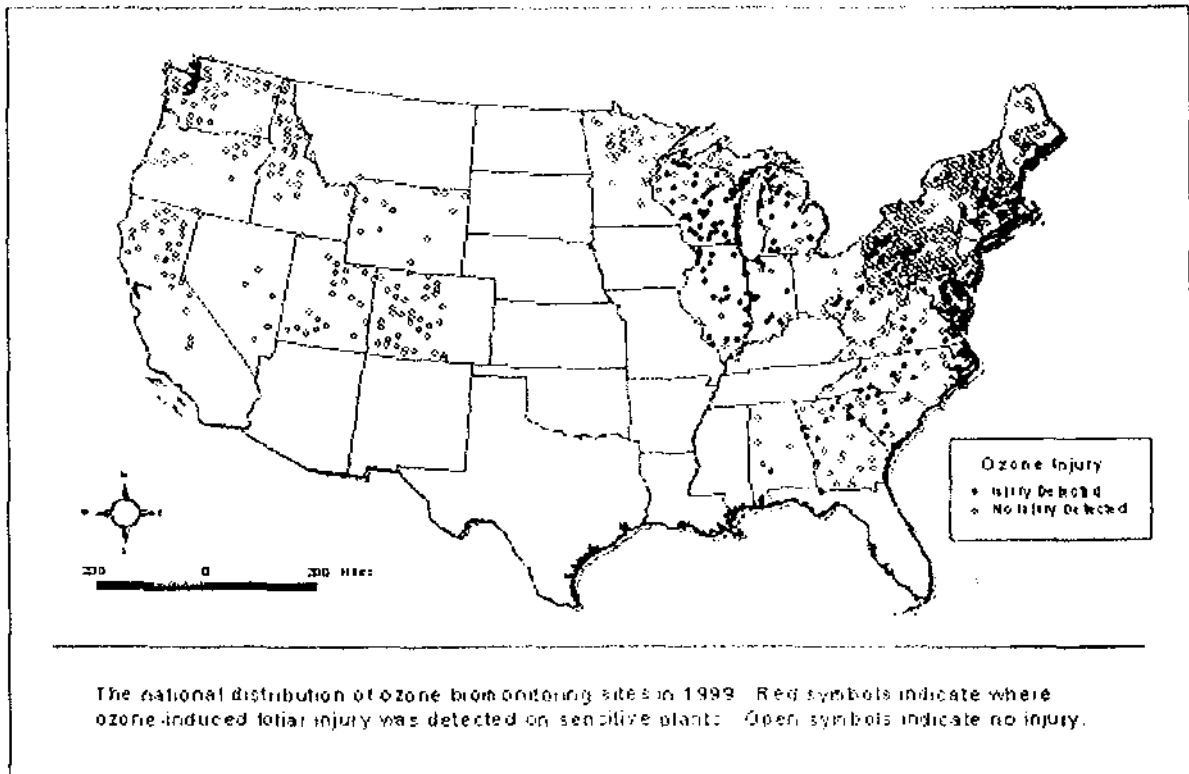


Figure 4. (USFS 2002c)

### National Distribution of Biomonitoring Sites - 1999



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### Traditional Ecological Knowledge Interviews

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- Ackley, Richard Sr. 2001. Mole Lake Reservation, Wisconsin. January 9
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- Ackley, William. 2000. Lac du Flambeau Reservation, Wisconsin. July 27
- Antone, Ira. 2000. Lac Vieux Desert Reservation, Michigan. October 4
- Antone, Ruth J. 2000. Lac Vieux Desert Reservation, Michigan. October 4
- Antone, Ruth J. 2001. Lac Vieux Desert Reservation, Michigan. February 13
- Baker, Deanna. 2000. Lac Courte Oreilles Reservation, Wisconsin. July 25
- Barney, Leslie. 2001. Fond du Lac Reservation, Minnesota. January 25
- Bassett, Arnold. 2001. Fond du Lac Reservation, Minnesota. January 25
- Bassett, Bob. 2001. Fond du Lac Reservation, Minnesota. January 25
- Benter, Evelyn. 2001. Mole Lake Reservation, Wisconsin. February 13
- Beson, Marcella. 2000. Lac du Flambeau Reservation, Wisconsin. July 24
- Bigboy, Arnold Sr. 2001. Bad River Reservation, Wisconsin. January 29
- Boyd, Russell. 2001. Mille Lacs Reservation, Minnesota. February 23
- Brown, George W. Jr. 2000. Lac du Flambeau Reservation, Wisconsin. July 24
- Brown, George W. Jr. 2000. Lac du Flambeau Reservation, Wisconsin. November 27
- Brown, George W. Jr. 2000. Lac du Flambeau Reservation, Wisconsin. December 4
- Chosa, Isabelle. 2000. Keweenaw Bay Reservation, Michigan. July 23
- Chosa, Isabelle. 2000. Keweenaw Bay Reservation, Michigan. September 29
- Chosa, Joseph J. 2000. Lac du Flambeau Reservation, Wisconsin. July 24
- Chosa, Joseph J. 2000. Lac du Flambeau Reservation, Wisconsin. July 27
- Chosa, Joseph J. 2000. Lac du Flambeau Reservation, Wisconsin. December 4

Chosa, Joseph J. 2001. Bad River Reservation, Wisconsin. April 16

Cloud-Parisien, Sylvia. 2000. Bad River Reservation, Wisconsin. December 13

Cloud-Parisien, Sylvia. 2001. Bad River Reservation, Wisconsin. January 29

Cloud-Parisien, Sylvia. 2001. Bad River Reservation, Wisconsin. April 16

Crowe, Clarence. 2000. Bad River Reservation, Wisconsin. December 13

Crowe, Clarence. 2001. Bad River Reservation, Wisconsin. January 29

Crowe, Harold. 2000. Bad River Reservation, Wisconsin. December 13

Crowe, Harold. 2001. Bad River Reservation, Wisconsin. January 29

Davis, Mary E. 2001. Fond du Lac Reservation, Minnesota. January 25

Dearbin, Elizabeth. 2001. St. Croix Reservation, Wisconsin. March 6

Debe, Temperance E. 2001. Fond du Lac Reservation, Minnesota. January 24

DeBrot, Phyllis. 2000. Lac Courte Oreilles Reservation, Wisconsin. July 25

Defoe, Leroy. 2001. Fond du Lac Reservation, Minnesota. January 25

Dewing, Lucy A. 2001. Fond du Lac Reservation, Minnesota. January 26

Dietzler, Loretta H. 2001. Mole Lake Reservation, Wisconsin. January 9

Dietzler, Loretta H. 2001. Mole Lake Reservation, Wisconsin. February 12

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Diver, Robert. 2001. Fond du Lac Reservation, Minnesota. January 25

Duffy, Joseph. 2001. Red Cliff Reservation, Wisconsin. January 4

Duffy, Joseph. 2001. Red Cliff Reservation, Wisconsin. February 5

Einertson, Joyce. 2001. Mole Lake Reservation, Wisconsin. January 9

Einertson, Joyce. 2001. Lac du Flambeau Reservation, Wisconsin. February 13

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Greensky, Florence. 2001. Fond du Lac Reservation, Minnesota. January 24

Grey, Donald. 2000. Lac du Flambeau Reservation, Wisconsin. November 27

Grey, Donald. 2000. Lac du Flambeau Reservation, Wisconsin. December 4

Holmes, Ruth. 2001. St. Croix Reservation, Wisconsin. March 6

Holmes, Ruth. 2002. St. Croix Reservation, Wisconsin. March 22

Houle, William J. 2001. Fond du Lac Reservation, Minnesota. January 26

Kegg, Betty. 2001. Mille Lacs Reservation, Minnesota. February 23

Kegg, Darrell Martin. 2001. Mille Lacs Reservation, Minnesota. February 23

Kupsco, Darlene. 2001. Bad River Reservation, Wisconsin. January 29

Lac du Flambeau Elder. 2000. Lac du Flambeau Reservation, Wisconsin. July 24

Lac Vieux Desert Elder. 2000. Lac du Flambeau Reservation, Wisconsin. October 4

LaFornier, Leo. 2001. Red Cliff Reservation, Wisconsin. January 4

Lang, Constance T. 2001. Mole Lake Reservation, Wisconsin. February 12

Larson, Raymond Jr. 2001. Fond du Lac Reservation, Minnesota. January 25

LeBlanc, Elmer. 2000. Bay Mills Reservation, Michigan. August 4

Ledbetter, Leona. 2000. Lac du Flambeau Reservation, Wisconsin. July 24

Ledbetter, Leona. 2000. Lac du Flambeau Reservation, Wisconsin. December 4

Loonsfoot, Virgil. 2000. Keweenaw Bay Reservation, Michigan. July 23

Lyons, Audrey. 2000. Bay Mills Reservation, Michigan. August 4

Mantilla, Barbara. 2000. Keweenaw Bay Reservation, Michigan. July 23

Martin, Rose. 2001. Lac du Flambeau Reservation, Wisconsin. February 13

Martineau, Ferdinand. 2001. Fond du Lac Reservation, Minnesota. January 25

Martineau, Loretta. 2001. Fond du Lac Reservation, Minnesota. January 25

McGeshick, Albert A. 2001. Mole Lake Reservation, Wisconsin. February 12

McGeshick, Charles Peter. 2001. Mole Lake Reservation, Wisconsin. February 12

McGeshick-Landru, Velma. 2001. Mole Lake Reservation, Wisconsin. February 12

McGeshick, Peter III. 2001. Mole Lake Reservation, Wisconsin. January 9

McGeshick, Peter, Jr. 2001. Mole Lake Reservation, Wisconsin. February 12

McGeshick, Peter, Sr. 2001. Mole Lake Reservation, Wisconsin. January 9

McGeshick, Raymond A, Sr. 2001. Mole Lake Reservation, Wisconsin. February 12

Mille Lacs Elder. 2001. Mille Lacs Reservation, Minnesota. February 23

Montano, Frank. 2001. Red Cliff Reservation, Wisconsin. February 5

Moreland, Delia. 2001. Fond du Lac Reservation, Minnesota. January 25

Munz, Rebecca A. 2000. Bay Mills Reservation, Michigan. August 4

Nelson, Rita. 2001. Lac du Flambeau Reservation, Wisconsin. February 13

Northrup, Jim. 2001. Fond du Lac Reservation, Minnesota. January 24

Northrup, Les. 2001. Fond du Lac Reservation, Minnesota. January 25

Northrup, Pat. 2001. Fond du Lac Reservation, Minnesota. January 26

Ojibway, Margaret. 2001. Fond du Lac Reservation, Minnesota. January 24

Olson, Katherine. 2001. Fond du Lac Reservation, Minnesota. January 24

Parish, Clifford. 2000. Bay Mills Reservation, Michigan. August 4

Parish, Geraldine. 2000. Bay Mills Reservation, Michigan. August 4

Pellerin, Wanda. 2001. Fond du Lac Reservation, Minnesota. January 25

Pitts, Myra J. 2001. Mole Lake Reservation, Wisconsin. February 12

Powless, Robert Sr. 2001. Bad River Reservation, Wisconsin. January 29

Rose, Joseph M. 2000. Bad River Reservation, Wisconsin. January 13

Rose, Joseph M. 2001. Bad River Reservation, Wisconsin. April 16

Sam, Doug. 2001. Mille Lacs Reservation, Minnesota. February 23

Sam, Leonard. 2001. Mille Lacs Reservation, Minnesota. February 23

Schreyer, Madeline. 2001. Red-Cliff Reservation, Wisconsin. February 5

Smith, Doris A. 2001. Fond du Lac Reservation, Minnesota. January 24

Smith, Helen. 2000. Lac Vieux Desert Reservation, Michigan. October 4

Smith, Raymond Sr. 2000. Lac Vieux Desrt Reservation, Michigan. October 4

Songetay, Jean. 2001. St. Croix Reservation, Wisconsin. March 6

Soukkala, Myrtle. 2001. Fond du Lac Reservation, Minnesota. January 26

St. Croix Elder. 2001. St. Croix Reservation, Wisconsin. March 6

Tadgerson, Wayne. 2000. Bay Mills Reservation, Michigan. August 4

Tainter, Art. 2000. Lac Courte Oreilles Reservation, Wisconsin. July 25

Tainter, Kenneth G. Sr. 2000. Lac Courte Oreilles Reservation, Wisconsin. July 25

Tainter, Kenneth G. Sr. 2000. Lac Courte Oreilles Reservation, Wisconsin. November 28

Tainter, Rose. 2000. Lac Courte Oreilles Reservation, Wisconsin. July 25

Thomas, Hildred. 2001. St. Croix Reservation, Wisconsin. March 6

Thomas, Hildred. 2002. St. Croix Reservation, Wisconsin. March 22

Thomas, John L. 2000. St. Croix Reservation, Wisconsin. March 6

Thomas, John L. 2000. St. Croix Reservation, Wisconsin. March 22

Toppings, Judy. 2001. Mille Lacs Reservation, Minnesota. February 23

Torgerud, Betty M. 2001. St. Croix Reservation, Wisconsin. March 6

Valliere, Wayne. 2002. Bad River Reservation, Wisconsin. January 12

VanZile, Robert Sr. 2001. Mole Lake Reservation, Wisconsin. January 9

VanZile, Robert Sr. 2001. Mole Lake Reservation, Wisconsin. February 12

Vetterneck, Elizabeth M. 2000. Lac du Flambeau Reservation, Wisconsin. July 24

Villiard, Mary Louis. 2001. Fond du Lac Reservation, Minnesota. January 24

- White, James Sr. 2001. Mille Lacs Reservation, Minnesota. February 23
- Wick, Corrine E. 2001. Fond du Lac Reservation, Minnesota. January 24
- Wick, Corrine E. 2001. Fond du Lac Reservation, Minnesota. January 26
- Wise, Randy. 2001. Fond du Lac Reservation, Minnesota. January 26
- Wiessen, Don. 2001. Fond du Lac Reservation, Minnesota. January 26

