Sheboygan River and Harbor Natural Resource Trustees

# Sheboygan River and Harbor Natural Resource Damage Assessment Restoration Plan and Environmental Assessment

Public Draft | November 2017


PREPARED BY:

United States Department of the Interior Fish and Wildlife Service

National Oceanic and Atmospheric Administration

Wisconsin Department of Natural Resources

WITH ASSISTANCE FROM:

Industrial Economics, Incorporated

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# SHEBOYGAN RIVER AND HARBOR NATURAL RESOURCE DAMAGE ASSESSMENT RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT

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| **PROJECT LOCATIONS** | Sheboygan River and Sheboygan River Basin, Sheboygan County, Wisconsin |
| **LEAD FEDERAL AGENCY FOR THE RESTORATION PLAN** | U.S. Department of the Interior, Fish and Wildlife Service (DOI, FWS) |
| **COOPERATING AGENCIES** | National Oceanic and Atmospheric Administration (NOAA)<br>Wisconsin Department of Natural Resources |
| **COOPERATING AGENCY STATEMENT -- NOAA** | DOI, the lead Federal Trustee for preparing the Sheboygan River and Harbor Restoration Plan/Environmental Assessment (RP/EA), invited NOAA to act as a cooperating agency pursuant to the National Environmental Policy Act (NEPA) (40 C.F.R. § 1508.5). NOAA agreed to act as a cooperating agency. A federal agency participating in the NEPA process as a cooperating agency may adopt the NEPA analysis of a lead agency without recirculating the statement when, after an independent review of the statement, the cooperating agency concludes that the analysis meets the standards for an adequate statement under the NEPA regulations and that the cooperating agency's comments and suggestions have been satisfied (40 CFR § 1506.3).<br><br>NOAA is participating in the development of the RP/EA as a cooperating federal agency for purposes of NEPA. This RP/EA describes the site history and natural resource damage assessment process, identifies a preferred alternative that includes acquisition and preservation of two land parcels, and evaluates potential environmental consequences of the preferred alternative. The RP/EA also identifies general types of restoration under the preferred alternative that may be proposed in the future and would be subject to future NEPA analyses.<br><br>Upon completion of the Final RP/EA, NOAA will conduct an independent review of the EA to inform NOAA's decision regarding adoption of the EA in accordance with 40 CFR § 1506.3 and its agency-specific NEPA procedures. Should NOAA adopt the EA, the RP/EA would be completed via signature on the final NEPA decision document.<br><br>Additionally, NOAA may serve as a cooperating agency for the purposes of NEPA (40 CFR 1501.6) for future restoration plans developed subsequent to this RP/EA for Sheboygan. When applicable, NOAA will be acknowledged accordingly in future restoration plans developed, and NOAA may serve as a lead agency, co-lead, or cooperating agency for future proposed restoration projects and NEPA analyses. |
| **COMMENTS/CONTACT PERSON** | Betsy M. Galbraith<br>Sheboygan River Natural Resource Trustee Council Coordinator<br>2661 Scott Tower Drive<br>New Franken, WI 54229<br>betsy_galbraith@fws.gov |

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|---|---|
| **ADMINISTRATIVE RECORD** | A copy of this document is available for review online at the following website:<br>https://www.fws.gov/midwest/es/ec/nrda/SheboyganHarbor<br><br>The Administrative Record is maintained by the FWS Green Bay Field Office, and is available at:<br>U.S. Fish and Wildlife Field Office<br>2661 Scott Tower Drive<br>New Franken, WI 54229<br>and<br>Mead Public Library<br>710 N 8th Street<br>Sheboygan, WI 53081 |

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## LIST OF ACRONYMS

| | |
|---|---|
| AOC | Area of Concern |
| ASRI | Alternative-Specific Remedial Investigation |
| BTEX | benzene, toluene, ethylbenzene, xylene |
| BUI | beneficial use impairment |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| COC | contaminant of concern |
| DOI | United States Department of the Interior |
| EA | environmental assessment |
| EIS | environmental impact statement |
| EPA | United States Environmental Protection Agency |
| ESD | Explanation of Significant Differences |
| FCA | fish consumption advisory |
| FONSI | Finding of No Significant Impact |
| FWS | United States Fish and Wildlife Service |
| GLC | Glacial Lakes Conservancy |
| GLRI | Great Lakes Restoration Initiative |
| IJC | International Joint Commission |
| NEPA | National Environmental Policy Act |
| NOAA | National Oceanic and Atmospheric Administration |
| NPL | National Priorities List |
| NRDAR | Natural Resource Damage Assessment and Restoration |
| PAHs | polycyclic aromatic hydrocarbons |
| PAS | Preassessment Screen |
| PCBs | polychlorinated biphenyls |
| PEC | probable effects concentration |

| | |
|---|---|
| ppm | parts per million |
| pptr | parts per trillion |
| PRPs | potentially responsible parties |
| RI/ES | Remedial Investigation/Enhanced Screening Report |
| RP/EA | Restoration Plan/Environmental Assessment |
| USC | United States Code |
| WDNR | Wisconsin Department of Natural Resources |
| WPSC | Wisconsin Public Service Corporation |
| ww | wet weight |

## EXECUTIVE SUMMARY

The purpose of this draft Restoration Plan/Environmental Assessment (RP/EA) is to describe how the Trustees for the Sheboygan River Natural Resource Damage Assessment and Restoration (NRDAR) -- the United States Fish and Wildlife Service, the National Oceanic and Atmospheric Administration (NOAA), and the Wisconsin Department of Natural Resources (WDNR) – will utilize funds from natural resource damages for the restoration of natural resources and services injured by the release of hazardous substances at the Sheboygan River and Harbor Site. Injuries to natural resources in the lower 14 miles of the Sheboygan River and adjacent floodplain, including sediment, soil, invertebrates, fish, reptiles, amphibians, birds, and mammals, were caused by exposure of those resources to polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and other contaminants. These injuries resulted in a loss of the ecological and recreational services that assessment area resources would otherwise have provided.

At this time, the Trustees have reached an agreement in principle to settle natural resource damage claims with parties potentially responsible for the hazardous substances in the Sheboygan River, including Tecumseh Products Company, Thomas Industries, and Wisconsin Public Service Corporation (WPSC). Under this settlement, these parties will pay $4.5 million to support restoration, preservation, recreational enhancements, and past Trustee costs relevant to natural resource injuries. This proposed settlement is described in three Consent Decrees that were recently lodged in a federal case arising from matters related to the Sheboygan River and Harbor Site.

Consistent with the United States Department of the Interior NRDAR regulations and the National Environmental Policy Act (NEPA), the Trustees evaluated a suite of alternatives for conducting the type and scale of restoration sufficient to compensate the public for natural resource injuries and service losses. This restoration would be implemented with the funds from the proposed settlement. Based on factors such as location, technical feasibility, cost effectiveness, provision of natural resource services similar to those lost due to contamination, and net environmental consequences, the Trustees identified Alternative C: Restoration within and beyond the Assessment Area as the preferred alternative. Under this Alternative, the Trustees envision conducting wetland and riparian restoration; wetland, riparian, and ecologically-associated upland preservation; and recreational enhancement projects within the Sheboygan River Basin within Sheboygan County. This would include preservation and potential restoration of Amsterdam Dunes and Willow Creek. The relevant portion of Amsterdam Dunes includes approximately 184 acres abutting Lake Michigan within the Sheboygan River Basin, just north of the Ozaukee-Sheboygan County line. This area is contiguous with over 144 additional acres recently preserved by Sheboygan County. The Willow Creek property is a unique, 140-acre urban open space located within the City of Sheboygan. Both of these properties currently support multiple habitat types, have potential for recreational opportunities, and are under threat of development and degradation.

This draft RP/EA is available for review and comment for a period of 30 days in accordance with 43 CFR § 11.81(d)(2). The Trustees will address public comments and will respond to those comments as part of the final RP/EA for the project types and two specific preservation projects proposed for the Sheboygan River NRDA restoration.

# CHAPTER 1 | INTRODUCTION

## 1.0 PURPOSE AND NEED FOR RESTORATION

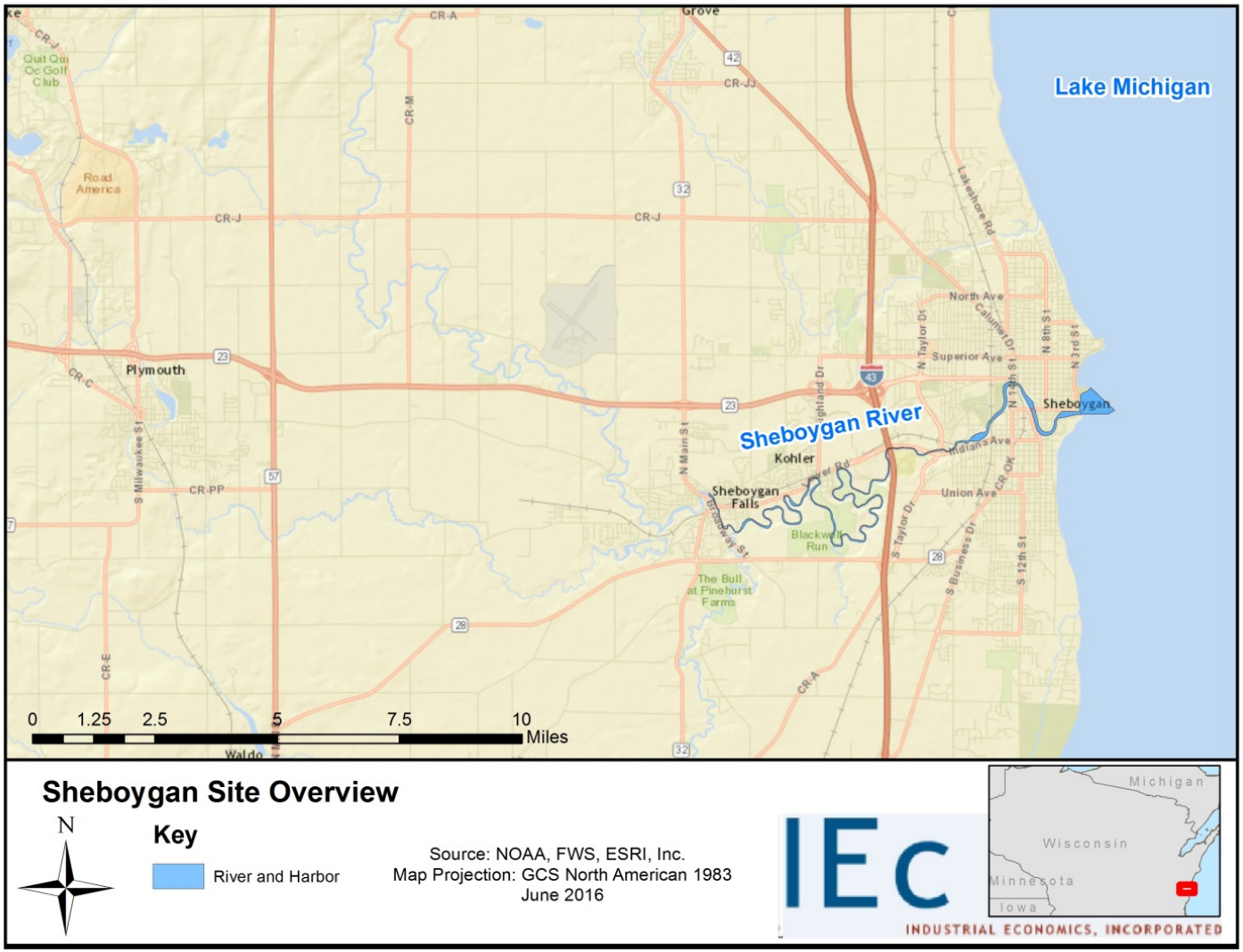
Located in East Central Wisconsin, the Sheboygan River flows generally eastward through the City of Sheboygan Falls, Village of Kohler, and City of Sheboygan into Lake Michigan (Exhibit 1-1). For decades, industrial facilities on the Sheboygan River released hazardous substances into the environment, contaminating both the Sheboygan River and the associated floodplain. The lower 14 miles of the Sheboygan River were designated a Superfund site by the United States Environmental Protection Agency (EPA) in 1986. In addition, this same portion of the Sheboygan River was designated a Great Lakes Area of Concern (AOC) by the International Joint Commission (IJC) in 1987. Primary contaminants of concern include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and other substances such as heavy metals that were released from the potentially responsible parties. Natural resources (e.g., surface water, sediments, invertebrates, fish, amphibians, reptiles, birds, and mammals) that utilize these habitats have been exposed to and adversely affected by the released hazardous substances. Over the last three decades, the EPA, in accordance with Superfund, has overseen removal and isolation of contaminated sediments in the Sheboygan River and Harbor. For example, in 2010, a variety of partners including the EPA Great Lakes National Program Office, Wisconsin Department of Natural Resources (WDNR), Sheboygan County, the City of Sheboygan and responsible parties collaborated on a Legacy Act project to remove contaminants that were not addressed by the Superfund program. Funds from the Great Lakes Restoration Initiative (GLRI) were used to conduct this Superfund betterment effort. In addition, Federal, state and municipal agencies collaborated on habitat restoration efforts within the AOC boundaries. These remedial actions, while beneficial, do not themselves compensate the public for past, present, and future contaminant-related injuries to natural resources such as the current “do not eat” fish consumption advisory.

The purpose of this draft Restoration Plan and Environmental Assessment (RP/EA) is to describe how the Trustees for the Sheboygan River Natural Resource Damage Assessment and Restoration (NRDAR) propose to use natural resource damage funds for the restoration, rehabilitation, replacement, or acquisition of equivalent natural resources and services injured by the release of hazardous substances at the Sheboygan River and Harbor Site. Consistent with the U.S. Department of

the Interior (DOI) NRDAR regulations and the National Environmental Policy Act (NEPA; 42 U.S.C. §4321 et seq.), this draft RP/EA includes an evaluation of reasonable restoration alternatives and identifies a preferred alternative, informing the public as to the types and scale of restoration that are expected to compensate for injuries to natural resources. In this draft RP/EA, the Trustees are proposing two land acquisitions for purposes of conservation and preservation, along with general categories of restoration projects. The Trustees anticipate that future restoration projects may occur on the two properties or at other locations. After the Trustees consider public comments submitted on this draft RP/EA, they will select a restoration alternative consistent with the environmental assessment for the proposed restoration project categories and the two specific preservation projects. The selected alternative will be identified in the final RP/EA. As additional restoration opportunities are identified, including other preservation possibilities, the Trustees will develop project-specific restoration plan(s), including additional analyses under the National Environmental Policy Act (NEPA), where applicable. Such future RP/EAs will consider the cumulative impacts of the proposed restoration project(s) along with other proposed or selected actions for the Sheboygan River and Harbor NRDAR Site.

The remainder of this Chapter discusses the relevant regulations and authorities under which the Trustees are conducting this NRDAR and corresponding draft RP/EA, the process and opportunities for public participation, and the administrative record.

**EXHIBIT 1-1 OVERVIEW MAP OF THE LOWER 14 MILES OF THE SHEBOYGAN RIVER AND HARBOR**



## 1.1 THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT AND THE DESIGNATION OF NATURAL RESOURCE TRUSTEES FOR THE SHEBOYGAN RIVER

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; 42 U.S.C. § 9601 et seq.) establishes a liability regime for the release of hazardous substances that injure natural resources and the ecological and human use services those resources provide. Pursuant to CERCLA, designated federal and state agencies, federally-recognized Indian tribes, and foreign governments act as trustees on behalf of the public to assess injuries and plan for restoration to compensate for those injuries. CERCLA further instructs the designated trustees to develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent of the injured natural resources under their trusteeship (hereafter collectively referred to as "restoration"). CERCLA defines "natural resources" to include land, fish, wildlife, biota, air, water, ground water, drinking water supplies and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the fishery conservation zone established by the Magnuson-Stevens Fishery Conservation and Management Act), any state or local government, any foreign government, any Indian tribes, or, if such resources are subject to trust restriction or alienation, any member of an Indian tribe (42 U.S.C. § 9601(16)). Regulations providing guidance to the Trustees on how to implement, in general, the NRDAR processes are contained in Chapter 43 of the Code of Federal Regulations (CFR), Part 11.

Federal agencies are designated as natural resource trustees pursuant to section 107 of CERCLA (42 U.S.C. § 9607(f)(2)(A)), Executive Order 12777, and the National Contingency Plan (40 CFR § 300.600). For the Sheboygan River and Harbor NRDAR, the federal Trustees are:

- The United States Department of the Interior, as represented by the United States Fish and Wildlife Service (FWS), the lead Federal agency for this RP/EA; and
- The National Oceanic and Atmospheric Administration (NOAA), on behalf of the United States Department of Commerce, a cooperating Federal Agency for this RP/EA.

State agencies are designated as natural resource trustees by the governors of each state pursuant to section 107 of CERCLA (42 U.S.C. § 9607(f)(2)(B)). For the Sheboygan River and Harbor NRDAR, the state Trustee is the State of Wisconsin Department of Natural Resources.

The state and federal Trustees for the Sheboygan River and Harbor NRDAR convened a Natural Resource Trustee Council to: 1) assess the natural resource injuries resulting from the release of hazardous substances in the Sheboygan River, and 2) develop and implement a restoration plan to compensate for those injuries.

## 1.2 THE NATIONAL ENVIRONMENTAL POLICY ACT

Actions undertaken by federal Trustees to restore natural resources or services under CERCLA are subject to NEPA, 42 U.S.C. § 4321, et seq., and the regulations guiding its implementation at 40 CFR Part 1500. NEPA and its implementing regulations set forth a process of environmental impact analysis, documentation, and public review for federal actions, including restoration actions. Specifically, NEPA provides a mandate and a framework for federal agencies to consider all reasonably foreseeable environmental effects of their proposed actions and to inform and involve the public in their decision-making process.

In general, federal agencies proposing a major federal action must develop an environmental impact statement (EIS) if the action is expected to have significant impacts on the quality of the human environment. When it is uncertain whether a contemplated action is likely to have significant impacts, federal agencies prepare an environmental assessment (EA) to evaluate whether an action would have significant impacts and therefore necessitate an EIS. If the EA demonstrates that the proposed action will not significantly impact the quality of the human environment, the federal agencies issue a Finding of No Significant Impact (FONSI), which satisfies the requirements of NEPA, and no EIS is required. If a FONSI cannot be made, then an EIS is required.

Additionally, over time, through study and experience, agencies may identify activities that do not need to undergo detailed environmental analysis in an EA or an EIS because the activities do not individually or cumulatively have a significant effect on the human environment. Agencies can define categories of such activities, called categorical exclusions, in their NEPA implementing procedures, as a way to reduce unnecessary paperwork and delay. The consideration of NEPA requirements in the context of the Trustees' identified restoration alternatives for the Sheboygan River NRDAR is described in Chapter 6.

## 1.3 COMPLIANCE WITH OTHER AUTHORITIES

In addition to CERCLA and NEPA, other legal requirements may apply to NRDA restoration planning or implementation. The Trustees will ensure compliance with authorities applicable to restoration projects. Whether and to what extent an authority applies to a particular project depends on the specific characteristics of a particular project, among other parameters. The subset of authorities listed below is the most relevant for the proposed acquisition and conservation actions and may be relevant for future restoration projects proposed for the Sheboygan River and Harbor NRDAR:

- Endangered Species Act (16 U.S.C. §§ 1531 et seq.),
- National Historic Preservation Act (16 U.S.C. §§ 470 et seq.),
- Coastal Zone Management Act (16 U.S.C. §§ 1451-1464),
- Federal Water Pollution Control Act (Clean Water Act, 33 U.S.C. §§ 1251 et seq.),
- Migratory Bird Treaty Act (16 U.S.C. §§ 703-712), and
- Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c).

## 1.4 PUBLIC PARTICIPATION

Public participation and review is an integral part of the restoration planning process. The Trustees have made this draft RP/EA available for review and comment for a period of 30 days in accordance with Section 111(i) of CERCLA, 42 USC 9611(i), and NEPA. The Trustees will address public comments and will respond to those comments as part of the final Restoration Plan/Environmental Assessment for the Sheboygan River NRDAR. Comments must be submitted in writing to:

Betsy M. Galbraith
Sheboygan River Natural Resource Trustee Council Coordinator
2661 Scott Tower Drive
New Franken, WI 54228
betsy_galbraith@fws.gov

A copy of this document is available for review online at the following website:

https://www.fws.gov/midwest/es/ec/nrda/SheboyganHarbor

Interested parties can obtain a hard copy of this draft RP/EA from the Trustees by submitting a written request to the following email or physical address:

Betsy M. Galbraith
Sheboygan River Natural Resource Trustee Council Coordinator
2661 Scott Tower Drive
New Franken, WI 54228
betsy_galbraith@fws.gov

After the Trustees consider public comments submitted on this draft RP/EA, the Trustees will select a restoration alternative consistent with the environmental assessment for the proposed restoration project categories and the two specific preservation projects. The selected alternative will be identified in the final RP/EA. As additional restoration opportunities are identified, including other preservation possibilities, the Trustees will develop project-specific restoration plan(s), with additional NEPA analyses where applicable. The Trustees will notify the public when these restoration plans are available for public review.

## 1.5 ADMINISTRATIVE RECORD

Pursuant to 43 CFR § 11.91(c), the Trustees maintain a publicly available Administrative Record for the Sheboygan NRDA, including restoration planning activities. As the lead Federal NRDAR Trustee, the Administrative Record is maintained by the U.S. Fish and Wildlife Green Bay Field Office, and is available at:

U.S. Fish and Wildlife Field Office
2661 Scott Tower Drive
New Franken, WI 54228

and:

Mead Public Library
710 N 8th Street
Sheboygan, WI 53081

# CHAPTER 2 | SHEBOYGAN RIVER SITE REMEDY AND NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION

This Chapter provides an overview of Site history and remediation, discusses the nexus between remediation and the Sheboygan River Area of Concern, and describes the goal of NRDAR and the specific actions the Sheboygan River NRDAR Trustees have taken to-date, including reaching an agreement in principle with the potentially responsible parties (PRPs) to settle the Trustees' claim for natural resource damages arising from hazardous substances released to the assessment area.

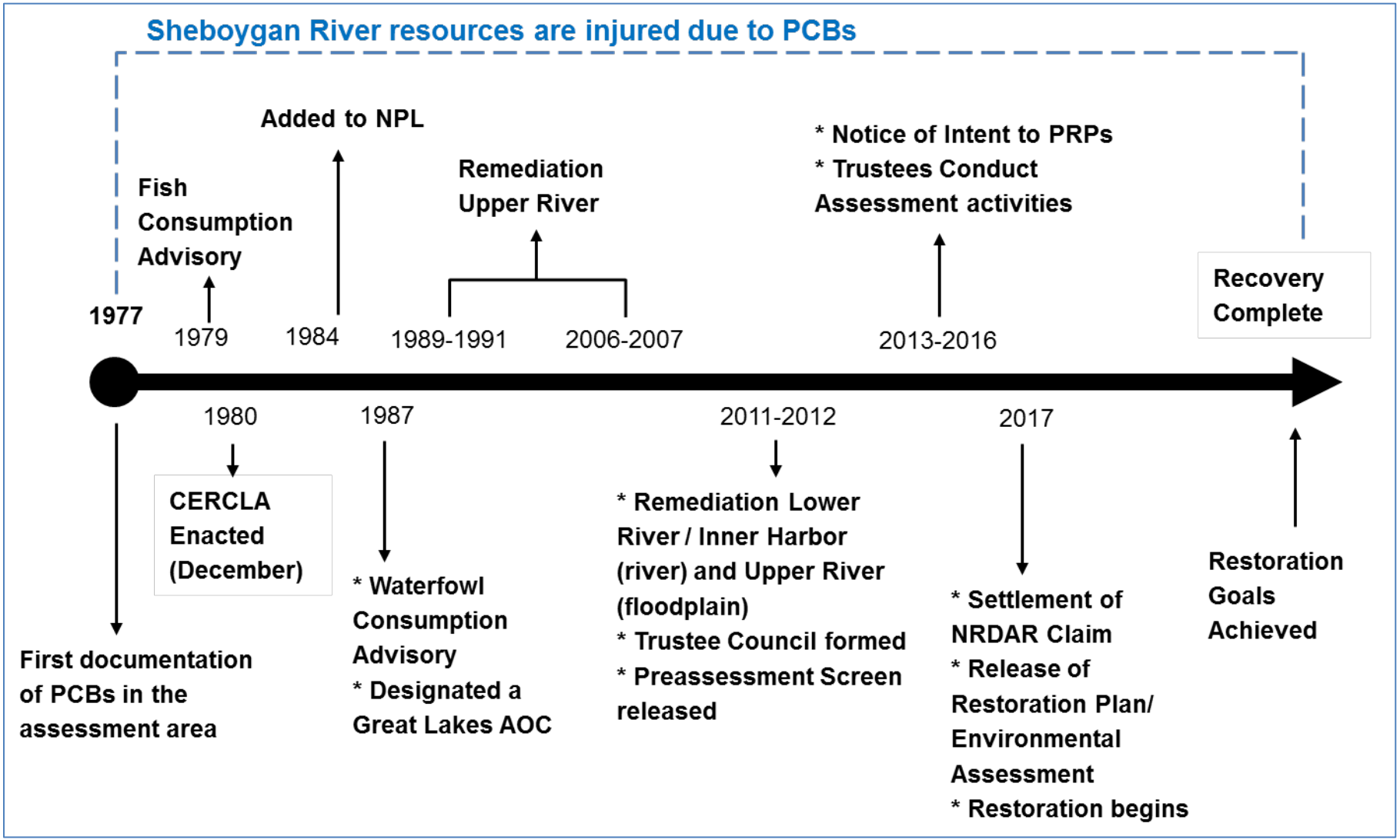
## 2.1 SUMMARY OF SITE HISTORY AND REMEDIATION

The Sheboygan River and Harbor remedial site (Site) includes the lower 14 miles of the Sheboygan River from Sheboygan Falls downstream to and including Sheboygan Harbor in Lake Michigan. The Site consists of the Sheboygan River and Harbor Superfund site (added to the National Priorities List [NPL][1] in 1986), the Kohler Company Landfill Superfund site (added to the NPL in 1984), and the former Campmarina manufactured gas plant site (not listed on the NPL but addressed by EPA as a Superfund Alternative Site). The Sheboygan River area has been listed as one of 43 Great Lakes Areas of Concern (AOCs) by the U.S. and Canada (see Section 2.2 for more details on the AOC). A timeline of major events is provided in Exhibit 2-1.

The U.S. Army Corps of Engineers ceased its previously routine dredging of the Sheboygan River channel in 1969 to avoid disturbing and spreading contaminated sediment (WDNR 1995). The subsequent restrictions on dredging resulted in limitations on use of these waters by private marinas and recreational boaters as well as commercial shipping. In 1974, EPA identified elevated levels of mercury, cadmium, chromium, lead, and zinc in sediments in Sheboygan Harbor (Appendix A to BBL 1990). In 1977, WDNR identified elevated concentrations of PCBs in Sheboygan Harbor fish as part of its statewide monitoring program (WDNR 1995), prompting EPA to test for and confirm the presence of PCBs in Sheboygan Harbor sediments that same year (BBL 1990). Since 1979, high PCB levels in fish have prompted WDNR to issue fish consumption advisories that recommend zero consumption of all resident fish species between Sheboygan Falls and the mouth of the Sheboygan River. WDNR also advises only limited consumption of Chinook salmon, Coho salmon, brown trout, lake trout, rainbow trout, yellow perch, whitefish, chubs and smelt from Lake Michigan and the Sheboygan River downstream of the first dam because of PCB contamination (WDNR 2011a). Additionally, wildlife consumption advisories have been in effect since 1987 for the area due to PCB contamination in waterfowl (WDNR 2011b).

[1] "The National Priorities List (NPL) is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation (EPA 2016a).

EXHIBIT 2-1 TIMELINE OF MAJOR REMEDIAL AND NRDAR-RELATED EVENTS FOR THE SHEBOYGAN RIVER SITE



Subsequent sampling found PCBs unevenly distributed throughout the river, with the highest concentrations (4,500 parts per million [ppm] and 4,300 ppm) in sediment immediately downstream from the Tecumseh Products Company facility in Sheboygan Falls (BBL 1990). Additional sources of chemical contamination to the Sheboygan River and Harbor include the Kohler Company facility and landfill, the Thomas Industries site, and the Campmarina manufactured gas plant site (Exhibit 2-2) (EPA 2000, NRT 2009). For example, sediment samples collected in the Sheboygan River near the Campmarina site between 1987 and 1995 had measured total PAH concentrations ranging from 5 ppm to 3,000 ppm, not including some samples with PAH concentrations so high that the samples were considered to be "oil saturated" (EPA 2012). Areas with elevated PAH levels also contained manufactured gas plant residuals (i.e., various waste products), most often observed as staining on sediments. Each of these facilities is discussed in detail below.

#### TECUMSEH PRODUCTS COMPANY PLANT

Tecumseh Products Company acquired the Die Cast Corporation in 1966, including the facility adjacent to the upper river in Sheboygan Falls. Metal die casting operations began at the facility in 1958 and ended in 2003 when Tecumseh Products Company closed the plant. The operation used hydraulic fluids containing PCBs from about 1966 to 1971, and unused PCB materials remained on-site until a WDNR-ordered cleanup in 1978, described below.

To control flooding of the Tecumseh facility's low-lying land next to the Sheboygan River, Tecumseh and the City of Sheboygan Falls jointly constructed a flood control dike in the early 1970s from on-site fill. Prior to the construction of the dike, PCB-contaminated materials that had been disposed in the yard behind the Tecumseh plant may have come in contact with Sheboygan River floodwaters (BBL 1990). The fill used to build the dike was later found to contain PCBs, and during periods of rain or high river flow it was a source of PCBs to the River (BBL 1990). In 1978, WDNR ordered Tecumseh to stop disposing of solid waste on its property and to excavate, collect, and properly store all materials likely to contain PCBs. The company complied with the order and excavated contaminated soils and disposed of them in an EPA-licensed PCB disposal facility offsite (EPA 2009). The dike was removed and replaced in 1979 (WDNR 1995).

#### THE KOHLER COMPANY

The Kohler Company owns and operates a landfill bounded on three sides by the Sheboygan River. The landfill has been in operation since the 1950s, primarily for the disposal of foundry and manufacturing wastes associated with the manufacture of bathroom fixtures. These included chrome plating sludge, enamel powder, hydraulic oils, solvents and paint wastes (WDNR 1995).

The Kohler landfill leached contamination, including metals, PCBs, PAHs, and volatile organic compounds including trichloroethylene and vinyl chloride into surrounding soils and groundwater (WDNR 2007). Sediment samples from a small tributary to the Sheboygan River near Kohler had elevated levels of cadmium, chromium, copper, lead, and zinc, indicating a potential release from the Kohler facility (BBL 1995). Groundwater in the shallow aquifer beneath the site previously flowed into the Sheboygan River, carrying hexavalent chromium and other chemicals (Geraghty and Miller 1992) until 1998 when a collection system was constructed to divert contaminated leachate to the City of Sheboygan wastewater treatment facility (WDNR 2007). As part of the same remedial action, the landfill was capped to contain remaining contamination on-site (WDNR 2007).

#### THOMAS INDUSTRIES

Thomas Industries manufactured compressors, vacuum pumps, and liquid pumps. Its machine shop operations consisted of milling, drilling, boring and tapping aluminum, steel, powder metal, cast iron, zinc and brass materials, and finishing and cleaning aluminum parts by acid wash, degreasing, vibratory and spindle finishing (EPA 2000). The Thomas Industries facility had outfalls that were found to contain PCBs at 200 parts per trillion (pptr) in direct surface water discharge to the Sheboygan River and 140,000 (pptr) in effluent discharged to the City of Sheboygan wastewater treatment plant (Kleinert et al. 1978).[2]

#### CAMPMARINA PLANT

Campmarina, a former Wisconsin Public Service Corporation coal gasification plant located along the east bank of the lower river, operated from 1872 to 1929 (WDNR 1995). Runoff from the gas plant released tars into nearby soil and groundwater. Groundwater at the site showed levels of arsenic, total cyanide, and benzene above the state enforcement standard (Simon Hydro-Search 1992 cited in WDNR 1995). Cyanide was also detected in the soil. The coal gasification plant is the suspected source of PAHs found in sediments near the Pennsylvania Avenue Bridge (BBL 1990) and the Eighth Street Bridge (RMT 1993 cited in WDNR 1995).

For the remedy, the river was divided into Upper, Middle, and Lower river reaches, and the Inner and Outer Harbors (Exhibit 2-2). The Upper and Middle reaches of the river are shallow and relatively fast-flowing and the riverbed is primarily cobble, sand, and gravel with isolated soft sediment deposits. The Lower River and Harbor are slow-flowing with continuous soft sediment beds (PRS 2009). Three dams are present within the Site boundaries: the Sheboygan Falls Dam at the upstream end of the Upper reach, the River Bend Dam in the Upper reach, and the Waelderhaus Dam at the boundary between the Upper and Middle reaches, all of which influence sediment transport and hydrology.

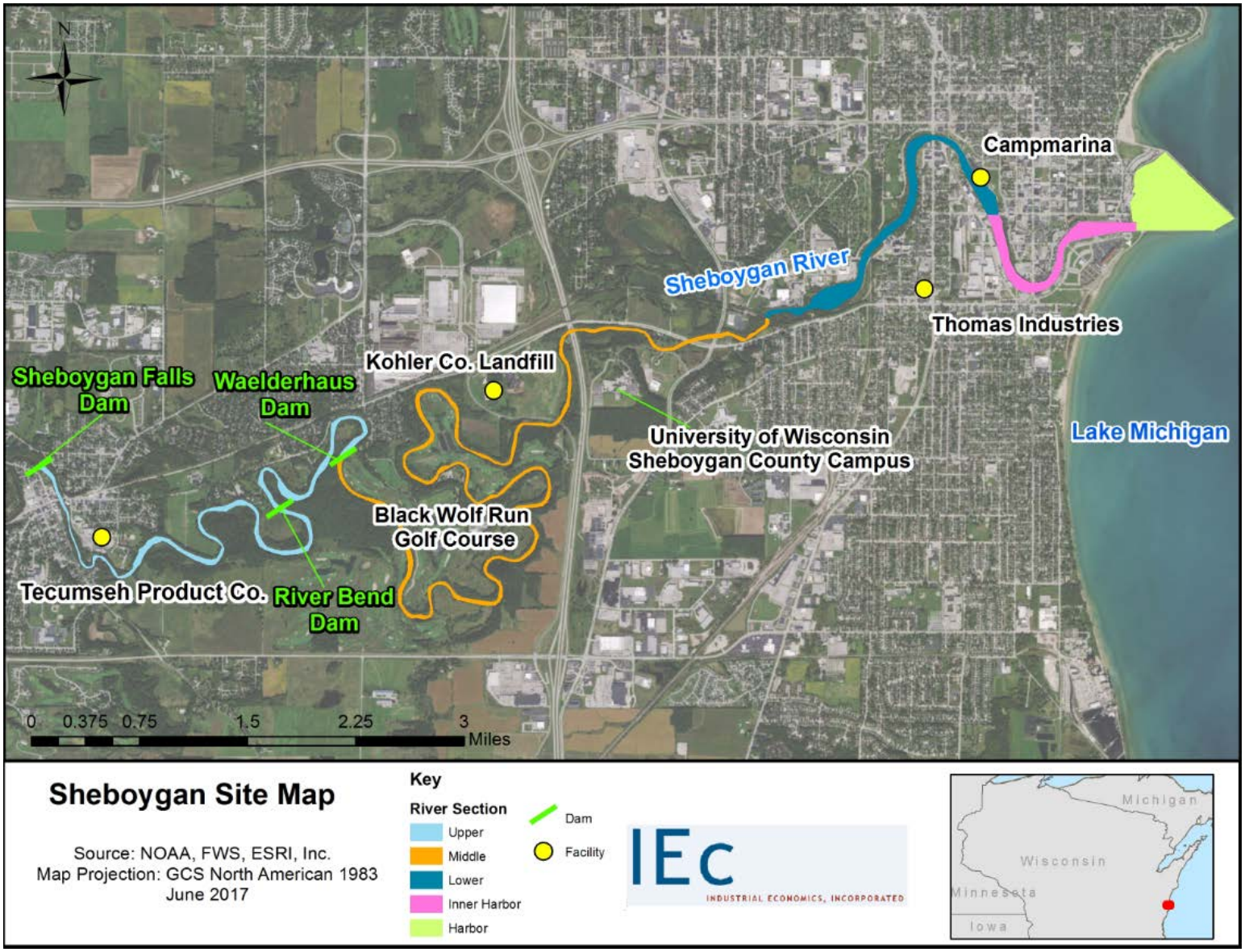
Remedial activities to-date have reduced both direct releases of hazardous substances from facilities and environmental contaminant levels (EPA 2000). For example, from 1989-1991, approximately 5,000 cubic yards of contaminated sediment were dredged from the Upper River, and a small section was armored to prevent contaminants from entering the river (EPA 2009). In 1997, the Kohler Landfill along the Middle River was capped, and a drain in the landfill was installed to capture contaminated groundwater and route it to the City of Sheboygan wastewater treatment plant (NOAA et al. 2012b). In 2004 – 2007, releases from the former Tecumseh Plant site were controlled by materials excavation and disposal, excavation of preferential contaminant pathways and installation of contaminant containment systems. Over 21,000 cubic yards of contaminated soft sediment from the Upper River was hydraulically dredged and disposed in 2006 and 2007. Most recently, dredging has occurred in the Lower River and Inner Harbor portions of the River (i.e., 2011-2012) in accordance with EPA Superfund requirements. This included a time-critical removal action conducted by Wisconsin Public Service Corporation (WPSC) in the Sheboygan River adjacent to the Campmarina site to address the high levels of PAHs in the sediment. This included dredging to achieve PAH remedial goals, and backfilling with a six-inch clean sand cover over a three acre area (EPA 2012).

[2] The U.S. EPA PCB criterion for the protection of aquatic life is 14 pptr (EPA 2016b).

Legacy Act Dredging Project , 2012. *Photo Credit:* Amy Kretlow

Follow-up monitoring will assess the success of the actions taken. It should be noted that a voluntary Superfund Betterment project was implemented in 2012 and 2013 to remove additional contaminants from the Lower River and Inner Harbor. Additional details on remedial activities are available in documents such as the Explanation of Significant Differences (ESD; EPA 2010), Remedial Investigation/Enhanced Screening Report (RI/ES; BBL 1990), Alternative-Specific Remedial Investigation (BBL 1995), EPA 5-Year Review (EPA 2009), and Record of Decision for the Campmarina site (EPA 2012).

**EXHIBIT 2-2 SHEBOYGAN RIVER AND HARBOR INDUSTRIAL FACILITIES AND REMEDIAL SECTIONS**



## 2.2 SHEBOYGAN RIVER AREA OF CONCERN

The lower 14 miles of the Sheboygan River, including the harbor, comprise one of 43 contaminated sites designated as an AOC under the U.S.-Canada Great Lakes Water Quality Agreement[3]. Areas of Concern are severely degraded geographic areas within the Great Lakes region. In 1987, the Sheboygan River was designated an AOC primarily due to PCB and PAH contamination in river and harbor sediments. However, the Remedial Action Plan for the AOC also identified heavy metals, fecal coliform bacteria, and excessive amounts of phosphorus and nitrogen as river contaminants (WDNR 1995). These various types of contamination have contributed to the following nine of 14 beneficial use impairments (BUIs) used by the United States and Canada in determining when to list and delist AOCs:

- Restrictions on fish and wildlife consumption,
- Loss of fish and wildlife habitat,
- Degradation of fish and wildlife populations,
- Degradation of benthos,
- Restriction on dredging activities,
- Eutrophication or undesirable algae,
- Degradation of phytoplankton and zooplankton populations,
- Fish tumors or other deformities, and
- Bird or animal deformities or reproduction problems.

WDNR, EPA, and other public and private partners have been working to remove these BUIs. Once all BUIs have been addressed, the AOC will be eligible for delisting.

Actions to address BUIs accelerated after the inception of GLRI in 2010 and with the completion of remedial actions under Superfund and other programs. In 2015, *restrictions on dredging* was the first BUI to be removed. Later that year, the *eutrophication or undesirable algae* BUI was also removed.

Habitat restoration projects to address the *loss of fish and wildlife habitat* and *degradation of fish and wildlife populations* BUIs were implemented in 2012. Approximately $5.7 million was invested using funding available through the GLRI. Projects included:

- Kiwanis Park shoreline restoration,
- Taylor Drive and Indiana Avenue wetland restorations,
- Taylor Pond rehabilitation,
- Wildwood Island restoration,
- Shoreline stabilization and in-stream habitat improvements,
- Targeted invasive species control, and

[3] The Great Lakes Water Quality Agreement is a formal international agreement, first signed in 1972 by Prime Minister Pierre Trudeau and President Richard Nixon, and updated in 1978, 1987 and 2012. The Agreement reflects the commitment of Canada and the U.S. to address a wide range of water quality issues facing the Great Lakes and the international section of the St. Lawrence River.

- Conservation planning for the former Schuchardt property.

These projects have improved and re-established habitat for a variety of fish and wildlife species. Additionally, recent efforts to implement agricultural best management practices throughout the Sheboygan River Watershed will complement the above efforts by helping reduce nonpoint source pollution to the river.

Since 2013, AOC efforts have shifted towards continued removal of invasive plant species along the river, maintenance and monitoring of the habitat projects that were completed in 2012, and ongoing monitoring of fish and wildlife populations. Monitoring data will inform whether BUI removal targets have been met, and thus whether additional BUIs may be removed.

Much has already been done in the area due to the AOC designation; over 400,000 cubic yards of contaminated sediment have been removed from the Sheboygan River, multiple priority habitat projects have been implemented, and monitoring activities have been initiated (WDNR 2015a). The Trustees have been working closely with those involved with the AOC to ensure projects selected for implementation using NRDAR settlement funds will complement AOC efforts. More information about the Sheboygan River AOC can be found in the 2015 Remedial Action Plan Update (WDNR 2015a) and at http://dnr.wi.gov/topic/greatlakes/sheboygan.html.

Wildwood Island Habitat Revival, 2012. *Photo credits:* Amy Kretlow and Debbie Beyer.

## 2.3 NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION

The goal of the NRDAR process is to replace, restore, rehabilitate, or acquire the equivalent of (together, restoration) injured natural resources and resource services lost due to the release of hazardous substances. To determine whether restoration is necessary at the Sheboygan River and Harbor site, the Trustees completed a number of interim steps outlined in the DOI NRDAR regulations (43 CFR Part 11), described below and outlined in Exhibit 2-1.

### 2.3.1 NRDAR ACTIVITIES AT THIS SITE

The Trustees signed a Memorandum of Agreement in 2012 to "provide a framework for coordination and cooperation among the Trustees to ensure timely and efficient implementation of a…NRDAR to restore natural resource injuries, including service losses, caused by [r]eleases" of hazardous substances, and to "use recovered damages to plan and implement actions appropriate to restore, replace, rehabilitate, or acquire the equivalent of natural resources or resource services injured or lost as a result of the [r]eleases"

(NOAA et al. 2012a). Shortly thereafter, they completed the first phase of the NRDAR process, issuing a preassessment screen (PAS) in 2012 (NOAA et al. 2012b). The purpose of the PAS is to determine the need to conduct a formal natural resource damage assessment. Based on a review of readily available data and a determination that the five preassessment criteria in 43 CFR 11.23(e) have been met (NOAA et al. 2012b), the Trustees concluded that further investigation and assessment is warranted at the Sheboygan River Site and that information existing at the time of the PAS indicated that there is a reasonable probability of making a successful natural resources damage claim pursuant to section 107 of CERCLA and section 311 of the federal Water Pollution Control Act.

In 2013, the Trustees issued a Notice of Intent to pursue a NRDA and sent it to the PRPs for the Sheboygan River Site. Following the Notice of Intent, the Trustees proceeded with assessment activities to evaluate injuries to natural resources and resource services resulting from releases of hazardous substances from the Sheboygan River Site. These assessment activities provided the Trustees with a thorough understanding of injuries to natural resources and losses in ecological and recreational services, as well as the type, scale, and scope of restoration activities that are necessary to address those injuries. Accordingly, the Trustees propose to resolve natural resource damages liability within the assessment area, as described in Section 2.3.3. The Trustees developed this draft RP/EA to explain how they plan to use natural resource damages for the restoration of natural resources and services at the Site.

### 2.3.2 RELATIONSHIP TO REMEDIAL ACTIVITIES

NRDAR is a process that occurs *in addition* to the remedial process conducted by regulatory agencies like WDNR and EPA (e.g., under Superfund). These two processes have different goals. Remedial action objectives are risk-based, and are developed to protect human health and the environment from further unacceptable harm. Remedies are selected based on evaluation criteria that are used to compare remedial alternatives and may result in contamination remaining in the environment above levels that existed prior to their release. In contrast, the goal of NRDAR is the restoration of resources to their baseline condition (i.e., what their condition would be absent the release). Losses resulting from natural resource exposure to released materials and/or hazardous substances are estimated over time until the resource is restored to baseline conditions (i.e., interim losses). These losses can therefore extend beyond the date of remedy completion due to material and/or contaminants being left in the environment at levels injurious to natural resources.

There are components of NRDAR and remedy however that overlap. For example, remedial decisions can include consideration of NRDA restoration objectives. Work to remedy a site may partially or completely restore injured natural resources, and NRDAR estimates take this into account. In addition, remedial actions may cause “collateral injury” to habitat, and assessment and restoration of this remedy-induced injury is also evaluated within NRDAR.

For the Sheboygan River NRDAR, the Trustees interacted with EPA by reviewing and providing comments on known restoration projects proposed within the Sheboygan River AOC, and by incorporating remedial data into the Trustees’ analyses of contaminant-related exposure and remedial impacts. Despite the remediation and restoration that has occurred (Section 2.1), however, additional but separate actions through the NRDAR process still need to be conducted.

### 2.3.3 NATURAL RESOURCE DAMAGES SETTLEMENT

Under CERCLA, there are two possible scenarios under which the Trustees would receive the funding needed to implement restoration: settlement or litigation. Under either scenario, the Trustees present a written demand to the PRPs for natural resource damages and the reasonable cost of the damage assessment (43 CFR § 11.91(a)). In the settlement scenario, the Trustees reach an agreement with the PRPs through a cost-effective and efficient process, providing the Trustees with timely certainty about the amount of funding available for restoration. In the litigation scenario, if the PRPs reject the demand, the Trustees can file a judicial claim (i.e., a lawsuit) in an attempt to win a judgment for the cost of restoration. However, litigation typically results in long delays and has an uncertain outcome with respect to the amount of funding that may be gained for restoration.

For the Sheboygan River and Harbor Site, the Trustees reached an agreement in principle to settle Tecumseh Products Company's, Thomas Industries', and WPSC's natural resource damages liability. Under this settlement, these parties will pay $4.5 million to support restoration, preservation, recreational fishing enhancements, and past Trustee costs relevant to natural resource injuries. This proposed settlement is described in three Consent Decrees that were recently lodged in a federal case arising from matters related to the Sheboygan River and Harbor Site. The Consent Decrees are subject to their own public comment process regarding the sufficiency of the settlement or other terms. Upon conclusion of the public comment process, if both the plaintiffs and then the Court find the decrees to be adequate, fair, reasonable, and in the public interest, the Court will officially enter the final Consent Decrees between defendants Tecumseh Products Company, Thomas Industries, and WPSC and plaintiffs United States and the State of Wisconsin.  The Trustees believe that the settlement provides a reasonable approach to achieving the goals of CERCLA to make the public and the environment whole, is fair and reasonable, and advances the public interest.

The public is encouraged to review and comment on this draft RP/EA, as well as under the separate commenting process for the Consent Decrees.

# CHAPTER 3 | AFFECTED ENVIRONMENT

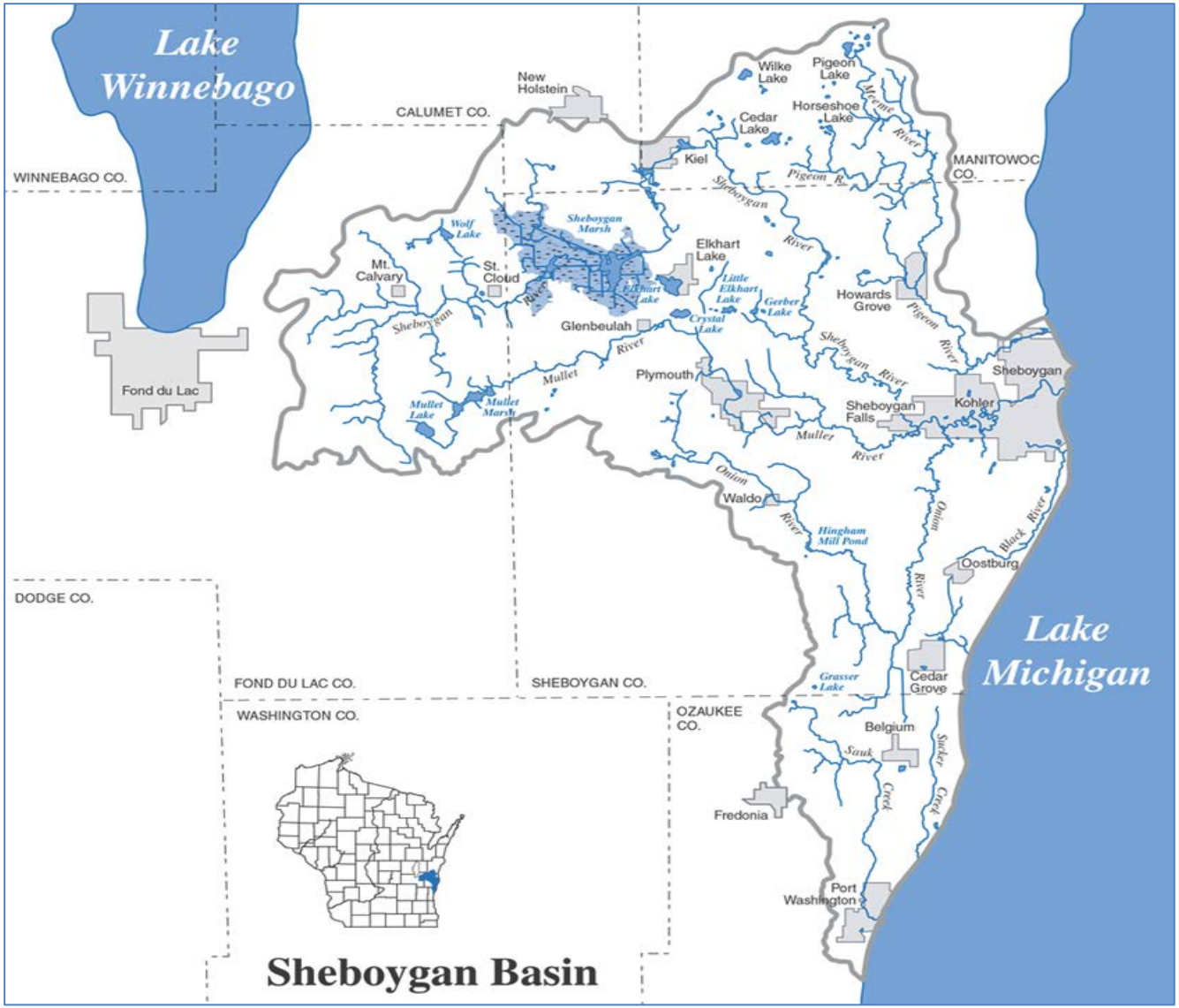
The Trustees assessed the current physical, biological, socioeconomic, and cultural resources within the affected area, described below. This information will assist the Trustees in evaluating and planning future restoration activities and ensure that potential restoration projects are designed to maximize ecological and human use benefits while minimizing or eliminating project-related adverse environmental consequences.

## 3.1 PHYSICAL ENVIRONMENT

The affected area encompasses the Sheboygan River and its surrounding watershed. The Sheboygan River Basin lies in portions of Sheboygan, Ozaukee, Fond du Lac, Calumet and Manitowoc counties and is part of the larger Great Lakes ecosystem (Exhibit 3-1). Covering about 260 square miles, most of which is in Sheboygan County, the Sheboygan River Watershed is the largest and possibly the most diverse watershed in the basin (WDNR 2001). Sheboygan County itself covers an area of 513 square miles, has over 26.3 miles of coastal shoreline along Lake Michigan on the east, and is bordered by the Kettle Moraine State Forest on the west and by the Sheboygan Marsh in the northwest (Sheboygan County PCD 2015). The Sheboygan River originates in Fond Du Lac County and flows eastward into Sheboygan County, ultimately entering Lake Michigan in the City of Sheboygan. The major tributaries to the Sheboygan River are the Onion and Mullet Rivers (WDNR 2001; WDNR 2012a), and the major urban areas along the lower stretch of the Sheboygan River are the cities of Sheboygan and Sheboygan Falls, and the Village of Kohler.

Land use throughout the watershed is primarily agricultural, but the downstream stretch of the Sheboygan River is almost entirely urbanized. Considering information about land use in the watershed enables the Trustees to assess the conservation landscape, anthropogenic pressures, and the manner in which lands are utilized, all of which may affect the benefits expected from planned restoration. For example, urbanization along the Sheboygan River decreases the amount of land available for restoration and increases costs associated with land preservation and restoration. Environmental quality is expected to become increasingly degraded in concert with urbanization and agricultural use, which can lead to increases in non-point source pollution from agricultural and urban runoff, industrial and municipal wastewater treatment plant discharges, stream channelization, dams, construction site erosion, and overall degradation of adjacent habitats (WDNR 2001, WDNR 2012a).

**EXHIBIT 3-1 SHEBOYGAN RIVER BASIN (SRBP 2016)**



## 3.2 NATURAL RESOURCES AND BIOLOGICAL ENVIRONMENT

Natural resources recognized under 43 CFR § 11.14(z) within the Sheboygan River Watershed include, but are not limited to sediment, soil, water (surface water and groundwater), aquatic plants, invertebrates, reptiles and amphibians, fish, birds, and mammals. Wildlife and other biological resources utilize a suite of habitats within the watershed ranging from open water to wetlands to upland forests. Some species are of particular concern to the Trustees, due to their threatened or endangered conservation status, such as the northern long-eared bat and the Pitcher's thistle, or because they are culturally and/or economically important. For example, certain species are caught and consumed through hunting and angling activities, such as waterfowl and fish. The varied habitats provide opportunities for recreation, including running, hiking, and water sports. This section describes the natural resources within the affected area, with particular attention to the various habitat types and wildlife species present.

### 3.2.1 HABITAT TYPES

A variety of habitats are present within the Sheboygan River Basin, including many types of wetland habitats such as coniferous swamps, floodplain forests, marshes, shrub swamps, and wet meadows. Some streams within the basin are classified as cold water streams and can sustain trout populations and a few of the Lake Michigan tributaries have runs of stocked steelhead and salmon (WDNR 2001). The Sheboygan River supports in-stream rock, cobble, and pool areas that provide habitat for numerous fish species. A large number of bird species use the river, harbor, and floodplain habitats for foraging and/or breeding. Forested areas along the banks provide habitat for a range of small mammals and white-tailed deer. Mammalian species associated with aquatic and semi-aquatic habitats of the Sheboygan River include bats, muskrat, raccoon, mink, and beaver. Because of their role in the food web, other animals of interest include turtles, insects, and benthic invertebrates such as insect larvae, mussels, and crayfish.

The biotic and abiotic resources identified above provide numerous ecological and human use services, including, but not limited to:

- Habitat for trust resources, including food, shelter, breeding, foraging areas, rearing areas, and other factors essential for survival;
- Fishing and hunting;
- Non-consumptive uses such as wildlife viewing, photography, and other outdoor recreation activities; and
- Primary and secondary water contact activities such as swimming and boating.

Land conversion, hydrological changes, invasive species, and forest fragmentation have had dramatic negative effects on the plant and wildlife communities throughout the affected area. However, the existing natural areas still host an important selection of rare and unique plant and animal species with specific habitat requirements, as well as those valued by the public for intrinsic or recreational purposes. For example, the Kohler–Andrae State Park near the Sheboygan River is comprised of wetland and aquatic communities including warm-water river, emergent marsh, Southern sedge meadow, and ephemeral pond, in addition to high quality examples of Northern dry-mesic forest, Northern mesic forest, floodplain forest, emergent marsh, alder thicket, and surrogate grasslands (WDNR 2012a).

### 3.2.2 FISH

The Sheboygan River contains distinctly different sections of stream habitat, with correspondingly different fish communities. The lower river and harbor are wide and slow-flowing with fine substrate, versus upstream areas where the river narrows, becoming shallow and relatively fast-flowing with substrate consisting of more course material. From Sheboygan Falls Dam to the mouth, the Sheboygan River is classified as a warmwater sport fish community consisting of smallmouth bass, largemouth bass, walleye, channel catfish, and assorted panfish, as well as forage species such as black bullhead, blacknose dace, common carp, central mudminnow, green sunfish, and white sucker. Intact floodplain forests and wetlands along this stretch of river are important to sustaining populations of spawning fish, such as walleye and northern pike. In spring and fall, some fish species use the river as a migratory corridor, including northern pike, walleye, white sucker, steelhead, three redhorse species, brown trout, Chinook salmon, Coho salmon and steelhead (WDNR 2012b).

Fishing is an important recreational and commercial activity. Heavy recreational fishing pressure occurs along Sheboygan River tributary streams during the spring and fall migrations of the species listed above. In addition, Sheboygan harbor supports a strong boat fishery for trout and salmon, utilized by many licensed charter captains and private vessels. Commercial fishermen target species such as chubs and whitefish (WDNR 2001). Although WDNR creel surveys document thousands of angler hours spent fishing in this area (B. Eggold, Personal communication), consumption advisories exist for all resident species between Sheboygan Falls and the mouth of the Sheboygan River, as well as additional consumption advisories for certain species from Lake Michigan and the Sheboygan River downstream of the first dam, in response to concerns about PCB contamination of the fish (WDNR 1979-2012). These advisories diminish the public's use and enjoyment of this natural resource.

### 3.2.3 WILDLIFE

The fish and other aquatic life dependent upon these rivers and their floodwaters in turn support a variety of mammalian and avian species, such as bald eagles, herons, mallards, otter (e.g., North American river otter), and mink. Species of birds such as herons, kingfishers, and sandpipers can be found within the riparian zone of the Sheboygan River, as well as mammalian species such as shrews, voles, and muskrats. The Sheboygan River Watershed is a high priority area for migratory birds due to its location along the Lake Michigan shoreline. Urban development and expansion of agricultural lands have resulted in highly fragmented forests, with edge habitats and open areas most common. This allows invasive species to displace the native plants on which birds depend for food and cover and reduces the high quality habitat available for migratory birds. Local breeding bird communities largely reflect these landscape changes with common woodlot and urban birds being most prevalent. There are, however, some remaining shrub and surrogate grassland habitats found within the fragmented landscapes along the Sheboygan River, which support several important grassland obligate bird species including eastern meadowlark, bobolink, and dickcissel, along with more common species such as clay-colored sparrow and savannah sparrow (WDNR 2012a).

### 3.2.4 THREATENED AND ENDANGERED SPECIES

Certain wildlife species have been adversely impacted by environmental stressors (e.g., habitat degradation) to an extent that their long-term viability is uncertain. Many of these species are afforded special protection under federal and/or state legislation for threatened and endangered species. Rare species, species of concern, and high-quality examples of natural communities have been documented within the larger assessment area that encompasses Sheboygan County, notably two species that are listed as federally threatened: the northern long-eared bat (*Myotis septentrionalis*) and the Pitcher's thistle (*Cirsium pitcheri*). The northern long-eared bat was federally listed as threatened in 2015. In the winter, northern long-eared bats require hibernacula, such as caves, and during the summer, these bats require forested areas that provide trees that serve as roosts. The Pitcher's thistle is a native thistle that grows on the beaches and grassland dunes along the shorelines of Lake Michigan, Lake Superior, and Lake Huron. It is most often found in nearshore plant communities, but it can grow in all non-forested areas of a dune system. The thistle was federally listed as threatened in 1988 due to dune habitat destruction from shoreline development, road maintenance and construction, and shoreline recreational activities. This plant can be found along the shoreline in Sheboygan County. Future restoration projects within the restoration area could potentially benefit these species.

## 3.3 SOCIOECONOMIC RESOURCES

The majority of the Sheboygan River Watershed is within Sheboygan County. This area is highly urbanized, with the City of Sheboygan alone supporting an estimated population of 48,787 in 2015 (www.census.gov). Interstate 43 crosses the Sheboygan River, connecting the area to Milwaukee about 50 miles to the south and Green Bay approximately 64 miles to the north (WDNR 2012a).

In terms of land use, fertile farmland comprises approximately 57 percent of Sheboygan County, supporting almost a thousand farms (USDA 2012). Other land uses in the county include natural areas (33%), residential (3.6%), and transportation (2.4%). In statistics published by the Sheboygan County Planning and Conservation Department, farmland decreased from 207,128 acres to 190,155 acres in the twenty year period from 1992 to 2012 (Sheboygan County PCD 2015). The recent USDA Census of Agriculture reports a seven percent drop in the number of farms in Sheboygan County from 2007 to 2012, but only a one percent decline in the land designated as farmland, indicating that the average size of farms has increased over time (USDA 2012).

The four main employment industries in Sheboygan County are manufacturing (including some agricultural–related jobs such as dairy processing), health care and social assistance, retail trade, and accommodation and food services. The distribution of employment across these sections has been relatively consistent since at least 2002, except for a slight shift in some jobs from manufacturing to wholesale trade between 2002 and 2012 (USDA 2015).

## 3.4 CULTURAL AND HISTORIC RESOURCES

The excerpt below is from "The State of the Sheboygan River Basin" report published in 2001 by WDNR:

> "The Sheboygan River Basin has experienced a long and rich natural resource history. Prior to the major influx of settlers from the eastern United States and Europe which began in the basin

during the early and middle 18th century, the local native populations were clustered on the bank or shore of practically every major stream and lake. The largest native villages were found along the shores of Lake Michigan (including what is now Kohler-Andrae State Park) and the extensive bluffs overlooking the Sheboygan Marsh (now the Sheboygan Marsh County Park and the State Wildlife Area). Fishing was the chief resource along the lake shore and hunting was the attraction for the native people in the marsh region. Besides hunting and fishing, these and the other native settlements also used the basin resources for limited agriculture. On September 26, 1833, the native people ceded all their lands on the west shore of Lake Michigan to the United States. The birth of Sheboygan County followed on December 7, 1836 when the county area, as it is today, was detached from Brown County. Following land surveys of the mid-1830s, land sales were made by the federal Government in tracts of not less than 80 acres at a minimum bid price of $1.25 per acre.

The natural resources of the basin area continued to be used by the early settlers in much the same way as by the native people. However, with the advent of road construction (many of which followed well-marked Native American trails such as current highways 23 and 28), the various hardwood and pine forests were cleared for timber use and the land was used for expanding agricultural purposes. In addition to the extensive timber harvest, wheat was the major agricultural crop until the 1880s. Depletion of the soil by this one-crop system and the ravages caused by the chinch-bug pest were generally responsible for the shift in land use to dairy farming, for which the basin remains famous today. The local rivers and streams were integral to the development of early manufacturing in the basin. They provided natural power to numerous saw-mills and flour-mills to process raw timber and wheat into the products exported by the growing number of local manufacturers. This led to a rapidly expanding economy and growth in the area particularly in the City of Sheboygan, then a major port on the western shore of Lake Michigan.

[Currently there are three dams along the Sheboygan River within the assessment area, all known or believed to be former mill dams. Dassow Milling Company built a dam on the river in Sheboygan Falls in 1950. The other two dams cross the river as it flows through Kohler– the upper one built in 1931, the lower one in 1947 (A. Knutson, Personal communication).]

This rich natural resource history (from the early settlement of the basin through today) has provided not only an understanding of how important natural resource management is, but how integral the current state of the basin is to our daily lives and to those of future generations." (WDNR 2001)

More recent archival reviews and archaeological surveys conducted at properties within the Sheboygan River Basin provide additional information on past land use. For example, in 2010, the City of Sheboygan considered options for developing the former Schuchardt farm (a 180-acre annexation located at Tl5N, R23E, Sections 21and 28, Town of Sheboygan). A literature search and archival review identified twelve archaeological and historical sites within or directly adjacent to the property, including uncatalogued burial sites, campsites, a trading post, bridge, and residence, indicating that the area has a rich cultural history (Fay 2010). The City subsequently funded an archaeological survey of two of the uncatalogued burial sites in 2011 (Fay 2011). Survey results demonstrated a lack of prehistoric material and no evidence of any human remains or burial features, instead identifying historic items of more recent

origin and an extensive fill area covering the agricultural fields. Fay (2011) concluded that past farming practices and recent topsoil removal and fill activity to bring the fields up to road level have greatly altered the natural landscape.

In May 2015, University of Wisconsin-Milwaukee staff conducted Phase I archaeological investigations for Sheboygan County's proposed Amsterdam Dunes Wetland Mitigation project located in southeastern Sheboygan County (Schneider et al. 2016). The archaeological investigations included archival/literature review, field investigations, and laboratory analysis. Archival/literature review identified two previously recorded archaeological sites associated with the project area. While no cultural materials were identified within the project boundaries, remnants of a historic/modern farmstead consisting of a foundation and water pump were encountered outside of, but in close proximity to, the eastern boundary of the project area. The historical significance of these finds is not certain, but historical plat maps show that the Village of Amsterdam was demarcated in 1852 and vacated in the early 1900s (Schneider et al. 2016, Dykstra and Premo 1997). Even after the village's decline, commercial fishing continued along Amsterdam's shores well into the twentieth century. For example, the Amsterdam Fish Company operated until the late 1940s (Dykstra and Premo 1997).

Field investigations of the proposed mitigation bank site also identified three lithic scatter and campsite/village sites dating to the Middle to Late Woodland period (2,300 to 1,000 years before present). They may provide important information about the prehistory of the region and may be eligible for listing in the National Register of Historic Places.

## 3.5 LANDSCAPE-SCALE ECOLOGICAL STRESSORS

Widespread, complex ecological stressors are causing changes to the ecological landscape of the Great Lakes. Some of these stressors, such as fluctuating water levels, invasive species, and non-point source pollution, have become both more prevalent and better understood over the last decade. This section describes Great Lakes water levels, water quality, invasive species, and habitat resilience as each relates to the ecological function of the Sheboygan River Watershed and the Sheboygan Harbor of Lake Michigan.

### 3.5.1 GREAT LAKES WATER LEVELS

Water levels in the Great Lakes and connected waterbodies are influenced by several factors, including regional precipitation, temperature, and lake-wide evaporation. Oscillations occur on decadal cycles, and mean monthly fluctuations of more than six feet have been measured (Harris and Wenger 2010). Between the 1960s and 1990s, the Great Lakes experienced higher than average water levels. Levels severely declined beginning in 1997, and January 2013 saw the lowest average monthly water levels in Lakes Michigan and Huron ever recorded (Cruce and Yurkovich 2011, Wisconsin Sea Grant 2013, Gronewold and Stow 2014). However, since September 2014, monthly water levels have been above average in all of the Great Lakes (NOAA 2015a). Looking forward, long-term atmospheric and hydrologic models predict that net decreases in Great Lakes water levels will occur, along with increases in extreme weather events such as flooding or drought (Hayhoe et al. 2010, Glick et al. 2011). Broad-scale and/or extreme water level fluctuations will likely affect both biological resources that utilize area habitat, as well as human uses of water resources such as navigation, agriculture, and public enjoyment (Winkler 2014). Long-term

changes in Great Lakes water levels will be important to consider when enhancing aquatic and wetland habitat.

### 3.5.2 WATER QUALITY

Clean water is essential to the proper function of all biological resources, including those that utilize aquatic, riparian, and terrestrial habitats. Water quality is mostly affected by the way people use the land. For example, conversion of open space to residential and commercial developments can increase the number and magnitude of pollution sources to surface water and groundwater. Runoff in Sheboygan has been a problem for decades. Barnyards and livestock feeding and pasture areas carry substantial loads of nutrients, solids, and bacteria to surface waters. Excess nutrients, like phosphorus and nitrogen in surface waters, can cause nuisance growths of aquatic weeds and algae and can be detrimental to sensitive fish and other aquatic species. Soil erosion from adjacent farm fields, streambanks and construction sites add to the sediment load in streams, resulting in excess sediment that blankets streambeds, fills in pools and riffles, and degrades reproductive habitat for fish species and associated fauna (WDNR 2015b, 2001; Sheboygan County PCD 2015). When the Sheboygan County's Soil Erosion Control Plan was published in 1988, approximately 61,000 acres of the county's cropland was in exceedance of the established T-value (tolerable amount of soil loss) from erosion. Since that time, several programs have been successful in getting landowners to participate in conservation planning to reduce soil loss, resulting in a significant drop of nutrients since the 1970's and thus improvements to water quality. Finally, habitat destruction and modifications (such as dams and the loss of vegetation along stream banks) have degraded water quality throughout the Sheboygan River Watershed (WDNR 2015b, 2001; Sheboygan County PCD 2015).

Looking forward, without intervention water quality will continue to be an issue. Therefore, the Trustees will encourage restoration techniques that have broad-scale benefits to water quality and runoff retention, such as creating riparian buffers and conserving land.

### 3.5.3 INVASIVE SPECIES

Aquatic invasive species have been a substantial contributor to dramatic alterations in Lake Michigan and its aquatic communities. Non-native species such as common carp, sea lamprey, round goby, rainbow smelt, alewife, common reed grass, zebra mussels, and quagga mussels have negatively impacted native species through direct predation, competition, and/or habitat alteration. Zebra and quagga mussels are currently found downriver in the Sheboygan Harbor (WDNR 2012b).

Invasive species also pose negative impacts to the local economy by threatening agriculture, forestry, navigation, tourism, recreation, and the fishing industry.

Several non-native invasive plants are well-established in the Sheboygan River Watershed. Riparian and wetland areas are the most vulnerable to the impacts of invasive species. Populations of Japanese knotweed, common reed grass, garlic mustard, and common and glossy buckthorn have been identified in the near-shore riparian area and floodplain along the Sheboygan River. Changing ecological conditions, such as declining lake levels and increasing air temperature, may increase the vulnerability of natural systems and favor the continued spread and proliferation of invasive species (NOAA 2010). Due to the increasing rate of invasions and associated negative impacts, a council developed the first statewide strategic plan on invasive species for Wisconsin (published in 2013). Because the majority of invasive species in the Great Lakes region are introduced through human activities, the plan recognizes that the continued spread of invasive species is preventable through partnerships, investment, and action (WDNR

2013a). The Trustees will review restoration options for invasive species management and benefit to native species.

### 3.5.4 HABITAT RESILIENCE

Although predicting future environmental conditions is an inherently complex task, the Trustees will consider habitat resilience when developing future restoration projects. In this context, resilience is the capacity of an ecosystem to respond to a disturbance or deviation from typical conditions by resisting damage and recovering quickly. For example, each habitat type (e.g., wetland, riverine, floodplain, grassland) best succeeds under a specific set of environmental parameters. These include, but are not limited to, precipitation, air temperature, and flooding regime. The organisms that rely on these habitats also have preferred conditions, with some species, such as those that are threatened or engendered, able to succeed only under a narrow range of environmental characteristics. To increase the resiliency of the NRDA restoration program, the Trustees will consider factors such as location, project scope, the characteristics of adjacent areas, proximity to surface water, and affected habitats and species within the Great Lakes watershed.

## 3.6 SUMMARY

The Sheboygan River Basin encompasses a suite of habitat types that together support a wide range of plant, fish, and wildlife species. Current land use and socioeconomic conditions, combined with recent trends in development and environmental degradation have adversely affected these natural resources. In addition to ecological functions, these natural resources also provide recreational, commercial, and cultural services. The Trustees will take these current resource conditions into account when evaluating and planning future restoration.

# CHAPTER 4 | NATURAL RESOURCE INJURIES AND SERVICE LOSSES

As part of the NRDAR process, the Sheboygan River Trustees evaluated available information to inform whether injury to natural resources had occurred as a result of exposure to hazardous substances released into the Sheboygan River. This Chapter describes the geographic scope within which the Trustees assessed injuries, the contaminants of concern (COCs) upon which this NRDAR is focused, the pathways of those COCs through the environment, the natural resources that have been injured or have the potential to be injured, and the associated losses in ecological and recreational services.

## 4.1 ASSESSMENT AREA

A key component in the determination of natural resource injuries is the assessment area. That is, "the area or areas within which natural resources have been affected directly or indirectly by the discharge of oil or release of a hazardous substance and that serves as the geographic basis for the injury assessment" (43 CFR 11.14 (c)). The geographic scope of the Sheboygan River assessment area includes aquatic habitat within the River and the adjacent 100-year floodplain (as defined by the federal Emergency Management Agency) from Sheboygan Falls Dam to the mouth of the River (Exhibits 4-1 and 4-2). To account for differences in the level of contamination in different stretches of the river, location of PRP facilities, locations of dams, and completed and on-going remedial activities, the Trustees divided the assessment area into sections based in part on the EPA sections delineated as part of the remedial investigation:[4]

- *Upper River*: Sheboygan Falls Dam downstream four miles to the Waelderhaus Dam in Kohler.
- *Middle River*: Waelderhaus Dam downstream seven miles to the former Chicago & Northwestern railroad bridge.
- *Lower River*: Chicago & Northwestern railroad bridge downstream to the mouth of the River, including the Inner Harbor.

[4] EPA defined River sections based on physical characteristics such as average depth, width and level of PCB sediment contamination.

**EXHIBIT 4-1 MAP OF GEOGRAPHIC SCOPE AND AQUATIC AND FLOODPLAIN ASSESSMENT AREA**

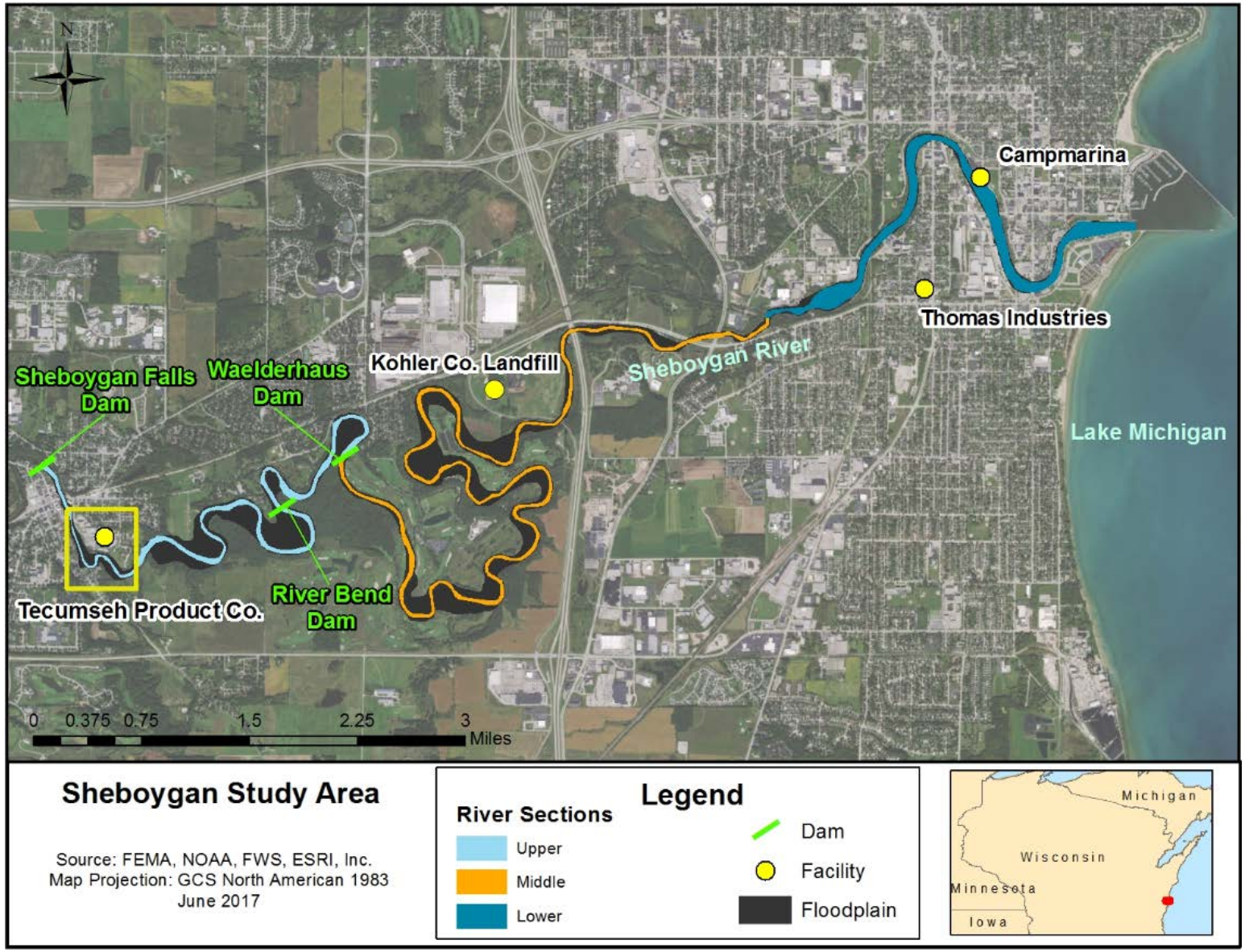


**EXHIBIT 4-2 ACREAGE OF ASSESSMENT AREA SECTIONS**

| HABITAT | ASSESSMENT AREA | ACRES |
|---|---|---|
| Aquatic | Upper River | 52 |
| | Middle River | 74 |
| | Lower River | 93 |
| Floodplain | Upper River | 111 |
| | Middle River | 170 |
| | Lower River | 18 |
| **Total** | | **518** |
| *Sources*: NOAA (Undated), FWS (Undated), FEMA (2007), Esri Inc. (Undated). | | |

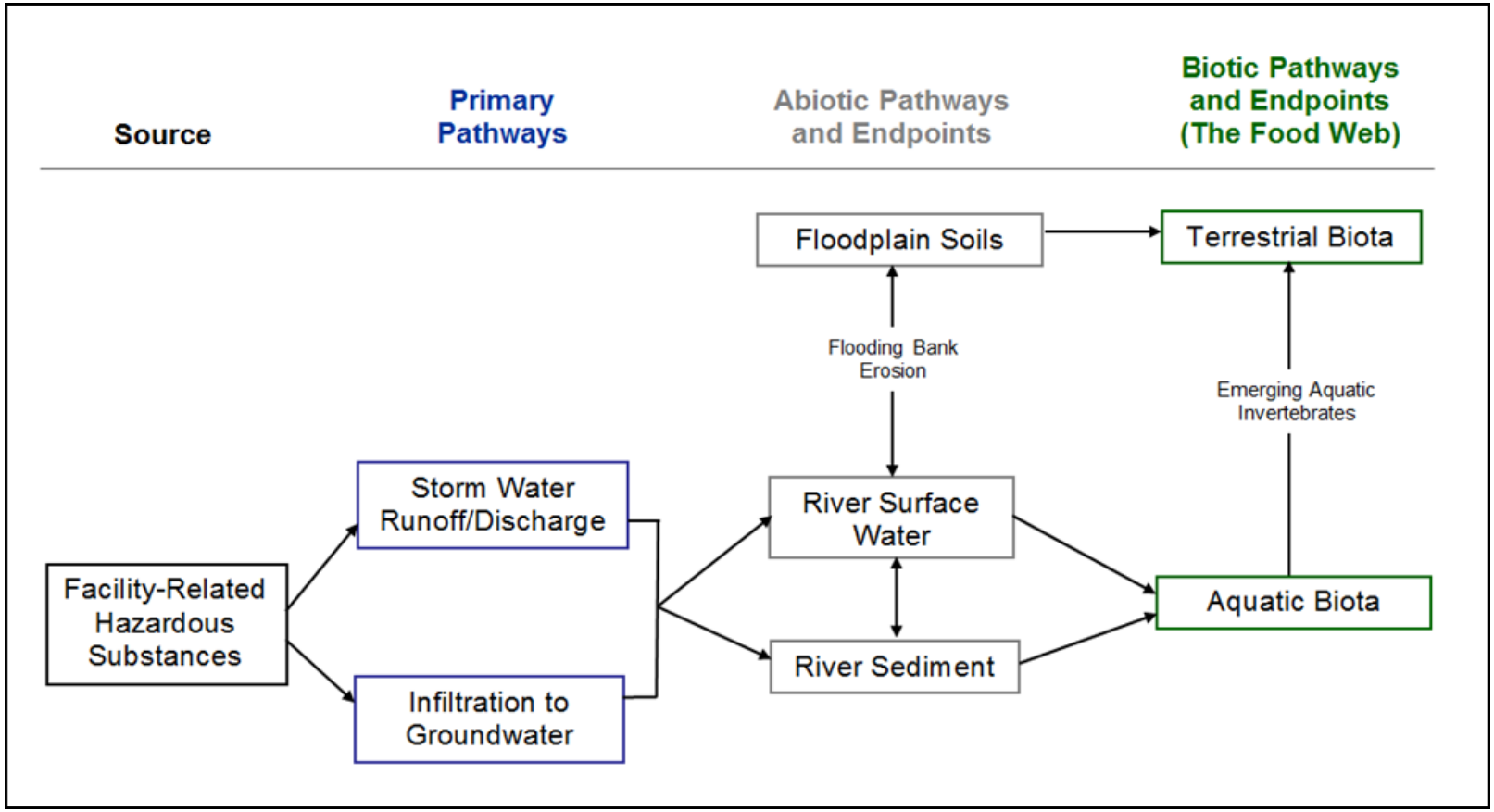
## 4.2 PATHWAY

Determination of injury requires documentation that there is a viable pathway for the released hazardous substance(s) from the point of release to a point at which natural resources are exposed to the released substance(s). Remedial documents describe hazardous substance releases from the PRPs. With regards to PCBs and PAHs, for example:

- The RI/ES for Tecumseh Products, Company reports releases of PCBs to the Sheboygan River (BBL 1990), and Section 2b of the Explanation of Significant Differences (ESD; EPA 2010) states that elevated PCB concentrations were found in a sewer pipe that runs from the Tecumseh facility to the Sheboygan River. This indicates a direct pathway of contaminants between the Tecumseh facility and the aquatic environment. In addition, Tecumseh used PCB-contaminated soils to construct a dike adjacent to the river, resulting in releases of PCBs to floodplain soils and groundwater and, via floods, to the Sheboygan River (EPA 2009).
- Two storm sewer outfalls from Thomas Industries to the Sheboygan River contained PCBs when sampled by WDNR in 1975 and 1976, indicating a direct pathway of contaminants from Thomas's facility to the aquatic environment (EPA 2000).
- Runoff from the Campmarina gas plant released tars, which typically contain substantial levels of PAHs, into nearby soil and groundwater (WDNR 1995).
- Kohler Company's landfill, located on the banks of the Sheboygan River, released metals and PCBs (EPA 2000).

Once released to the environment, the physical and chemical properties of PCBs and PAHs allow them to be taken up by biota, bioaccumulated, and, in the case of PCBs, biomagnified through the food web (Eisler 2000). Site-specific data document PCBs and PAHs in sediment and PCBs in biological resources (e.g., fish) within the assessment area. Fish and other contaminated prey items then act as a pathway for PCBs and PAHs to higher trophic level organisms (Exhibit 4-3).

**EXHIBIT 4-3 PATHWAY FATE AND TRANSPORT EXAMPLES**



## 4.3 BASELINE

In order to measure injuries, and therefore determine damages and restoration activities, the baseline conditions (i.e., physical, chemical, and biological conditions) of the affected resources and associated services must be established. Baseline is "the condition or conditions that would have existed at the assessment area had the…release of the hazardous substance…not occurred" (43 CFR § 11.14 (e)). For this draft RP/EA, the Trustees established baseline for the assessment area using data from a reference area: aquatic and floodplain habitat upstream of Sheboygan Falls Dam, focusing on the toxicological effects of contaminant exposure. Land use upstream of the site is primarily agricultural, and there are no known industrial sources of contaminants in that section of the river (EVS and NOAA 1998). A general review of data from the reference area indicates contaminant levels that are not expected to cause injury to natural resources. For example, PCB and PAH concentrations in reference area sediment (to which sediment-dwelling organisms are exposed) and PCB concentrations in reference area fish (species consistent with those species found in the assessment area)[5] are below toxicity thresholds. Therefore, the Trustees concluded that but for the hazardous substance releases from the PRPs into the Sheboygan River and floodplain, natural resources in the assessment area would not be injured as a result of exposure to those contaminants.

## 4.4 ECOLOGICAL INJURIES AND LOSSES

One method for determining injury to natural resources, as defined in the DOI NRDAR regulations, is to demonstrate adverse changes in an organism's viability (e.g., decreased reproduction) as a result of exposure to the relevant contaminant of concern.

The Trustees identified a set of natural resources within the assessment area on which to focus the assessment based on representativeness of the relevant ecosystem, and for which both exposure and effects information are readily available. Aquatic representative resources include sediment, fish, aquatic birds, and piscivorous mammals. Floodplain representative resources include soil invertebrates, small mammals, and songbirds (Exhibit 4-4).

To assess injury resulting from PCB exposure, the Trustees gathered readily available, site-specific information about past, present, and predicted future PCB concentrations for each representative resource within the assessment area. Because the number of years for which PCB data are available is limited, data were combined within each River section and habitat across years, considering the timing of remedial activities (Exhibit 4-5). Data from the 1980s are minimal; therefore, it is possible that these data combinations underestimate contaminant levels and corresponding injury for some resources, as concentrations were likely higher in the past. The Trustees then compared PCB concentrations in sediment, fish, soil, and the diet of birds and mammals to literature-based toxicological thresholds. These thresholds indicate levels at or above which a toxic effect – focusing on physiological, reproductive, and lethal effects – due to PCBs is expected to occur. The Trustees also reviewed site-specific effects studies, which provide additional evidence of injury. For amphibians and reptiles, the potential for injury is described, as exposure and effects information for these resources is limited.

To assess injury resulting from PAH exposure, the Trustees focused on sediment-dwelling invertebrates, which form the base of the riverine food chain. Benthic invertebrates spend the majority of their life cycle

[5] PAH concentrations in reference area fish tissue are not available.

burrowed or feeding either in the sediment or at the sediment-surface water interface. Consequently, benthic invertebrates come into direct contact with contaminants in sediment, sediment pore water, and surface water. The Trustees evaluated site-specific toxicity data, compared measured concentrations of PAHs in sediment to literature-based adverse effects thresholds, and assessed the impacts of remedial actions.

**EXHIBIT 4-4 SUMMARY OF REPRESENTATIVE RESOURCES**

| HABITAT | REPRESENTATIVE RESOURCE | EXAMPLE SPECIES |
|---|---|---|
| Aquatic | Sediment invertebrates | Midges, caddisflies |
| | Fish | Largemouth bass, smallmouth bass, channel catfish |
| | Aquatic birds | Tree swallow, mallard, tern, osprey |
| | Piscivorous mammals | Mink, otter |
| | Amphibians and reptiles | Wood frog, green frog, snapping turtle |
| Floodplain | Soil invertebrates | Earthworm |
| | Small mammals | Shrew, mole |
| | Songbirds | Finch, martin, bunting |

**EXHIBIT 4-5 ANALYSIS OF PCB DATA OVER TIME**

| HABITAT | ASSESSMENT AREA | YEARS ACROSS WHICH DATA WERE COMBINED | RATIONALE |
|---|---|---|---|
| Aquatic | Upper River | 1981-1991 | Pre-remedy and during first remedy (remedy occurred 1989-1991) |
| | | 1992-2007 | Post-first remedy and during second remedy (remedy occurred 2006-2007) |
| | | 2008-2012 | Post-second remedy |
| | Middle River | 1981-2012 | No remedial activities occurred |
| | Lower River | 1981-2010 | No remedial activities occurred (remedy occurred in 2011-2012 but data for those years are not available at this time) |
| Floodplain | Upper River | 1981-2012 | Pre-remedy and during remedy (remedy occurred in 2011-2012) |
| | Middle River | 1981-2012 | No remedial activities occurred |
| | Lower River | 1981-2012 | No remedial activities occurred |

### 4.4.1 INJURY TO AQUATIC RESOURCES

#### Sediment

Injury to sediment is defined as a component of injury to surface water resources, and has occurred when:

> *Concentrations and duration of substances [are] sufficient to have caused injury…to ground water, air, geologic, or biological resources, when exposed to surface water, suspended sediments, or bed, bank, or shoreline sediments (43 CFR § 11.62(b)(1)(v)).*

Because regulatory sediment quality criteria for PCBs and PAHs in Wisconsin do not exist, the Trustees compared PCB and PAH concentrations in sediment to literature-based adverse effects levels. The Trustees calculated the average PCB concentration in each River section and time period, aggregating data as presented in Exhibit 4-5. Average sediment concentrations range from 2.74 to 91.43 ppm, exceeding the consensus-based probable effect concentration (PEC; i.e., the concentration above which adverse effects on benthic organisms are probable; MacDonald et al. 2000) of 0.676 ppm (Exhibit 4-6). Similarly, average concentrations of PAHs in sediment ranged from 0.26 to 100 ppm, exceeding the PEC of 22.8 ppm. These exceedances indicate probable injury to sediment.

#### Biological Resources

Biological resources provide a suite of ecological services (e.g., food web sustainability). Injury to a biological resource has resulted from the release of a hazardous substance if the concentration of the substance is sufficient to:

> *(i) Cause the biological resource or its offspring to have undergone at least one of the following adverse changes in viability: death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations (43 CFR § 11.62 (f)(1)).*

Note that injury can also be determined by the existence of a consumption advisory. This is discussed in Section 4.5.

The Trustees determined injury to benthic invertebrates, fish, piscivorous birds, and piscivorous mammals. To do so, the Trustees applied various approaches, including: 1) results of site-specific toxicity tests, and 2) comparison of body burden (i.e., tissue) or diet PCB levels to adverse effects thresholds reported in the literature. In this case, adverse effects thresholds are the concentrations of PCBs determined through scientific study and reported in the scientific literature to be associated with negative effects on an organism. Additional information indicates that potential injury to amphibians and reptiles has also occurred.

**<u>Benthic Invertebrates</u>**

The Trustees reviewed the results of site-specific toxicity tests conducted as part of the 2008 Campmarina remedial investigation (NRT 2009). These tests exposed benthic invertebrates to assessment area sediment near the Campmarina site, and found significant invertebrate mortality resulting from the toxicity of PAHs and benzene-toluene-ethylbenzene-xylene compounds (BTEX; a lighter class of oil-related compounds; Exhibit 4-6). This indicates injury to benthic invertebrates.

**EXHIBIT 4-6 BENTHIC INVERTEBRATE SITE-SPECIFIC TOXICITY TEST RESULTS BASED ON PAH CONCENTRATIONS (NRT 2009)**

| CONCENTRATION (SUM OF 13 PAHS IN PPM) | PERCENT MORTALITY OBSERVED IN TOXICITY TEST |
|---|---|
| 30 | 10% |
| 45 | 20% |
| 129 | 45% |
| 400 | 60% |
| 1000 | 85% |
| 2000 | 95% |

## Fish

The Trustees compiled readily available site-specific total PCB concentration data using the following steps:

- Excluded salmonids: salmonids spend most of their adult lives in Lake Michigan, only entering the Sheboygan River to head upstream to spawn. Lake Michigan is also contaminated with PCBs and data are insufficient to determine what proportion of PCBs salmonids accumulate in the Lake as compared to the Sheboygan River.
- For studies with limited sample location information where a multi-fish sample could have been taken from the Middle or Lower River, assigned half the sample count to the Middle River and half to the Lower River.
- For samples reported as fillet tissue concentrations, multiplied by a factor of three to convert to whole body concentrations (Exponent 2006).
- Calculated average PCB concentrations in each River section and time period, aggregating data as described in Exhibit 4-5.

Average PCB concentrations in fish range from 16.39 to 41.72 ppm whole body wet weight (ww). These concentrations exceed concentrations reported in the literature to cause adverse effects on relevant fish species. For example, walleye exhibited immunological impacts at a body burden of 4.6 ppm PCBs (Barron et al. 2000), minnow eggs containing 5.1 ppm PCBs had reduced hatchability (Hansen et al. 1974), and Monosson (1993) reported adverse impacts on the fish larvae survival at 5.0 ppm PCBs. This indicates that injury to fish has occurred (Exhibit 4-7).

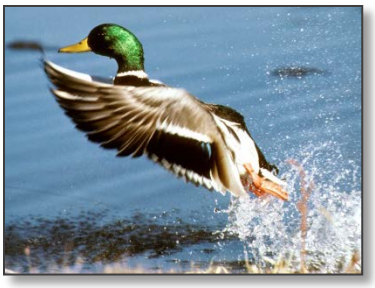
Largemouth bass, walleye, and northern pike (WDNR 2016)

## Aquatic Birds

Site-specific studies document exposure of aquatic birds to PCBs in the assessment area. Heinz et al. (1984) reported PCB body burden in herons, kingfishers, and sandpipers ranging from 23-218 ppm. From 1986-1989, WDNR measured PCBs in breast tissue of <0.2-18 ppm in mallards and <0.2-25 ppm in lesser scaup (WDNR Unpublished Data). A more recent study by WDNR (2013b) found elevated PCB breast tissue concentrations in mallards and scaup of approximately 4 ppm. In addition, Patnode (Personal communication as cited in EVS and NOAA 1998) reported impaired hatching and induction of liver enzymes in 12 day old tree swallows nestlings as a result of PCB exposure. In 2010-2013, Custer and Custer (Undated) also found PCB concentrations in tree swallows similar to those reported by Patnode (i.e., 3-10 ppm) (Powerpoint as cited in EVS and NOAA 1998).

Because minimal data on the adverse effects of PCBs in avian body tissue are available, the Trustees evaluated injury based on consumption of contaminated prey using the following steps:

- Identified bird species that represent different foraging guilds: tree swallow, mallard, tern, and osprey.
- Estimated the dietary composition of each species (adapted from Poole 2013):
  - *Tree swallow*: 100 percent insects.
  - *Mallard*: 50 percent insects, 50 percent plants.
  - *Tern*: 100 percent fish less than or equal to 10 cm in length.
  - *Osprey*: 100 percent fish greater than or equal to 10 cm in length.



- Derived species-specific dietary PCB concentrations in each River section using measured fish data and modeled insect and plant data (sediment data combined with corresponding bioaccumulation factors).

Dietary concentrations for the four bird species range from 2.11 to 126.29 ppm PCBs and exceed adverse effects thresholds. For example, at approximately 10 ppm PCBs in diet mallards experienced immunological changes (Friend and Trainer 1970), and a reduction in number of nesting pairs, nest attentiveness, hatching, and young fledged was reported in ring doves (Tori and Peterle 1983, Peakall and Peakall 1973, Peakall et al. 1972) . This indicates injury to aquatic birds has occurred (Exhibit 4-7).

## Piscivorous Mammals

Site-specific studies document exposure of piscivorous mammals to PCBs in the assessment area. For example, a recent study by WDNR (2013c) reports low abundance of mink along the Sheboygan River downstream of the Sheboygan Falls Dam. Those mink that were captured had elevated PCB concentrations. Seeley (1993), however, was unable to find mink within the same area, despite the existence of appropriate habitat, and concluded that PCBs may be the cause for lack of abundance.

Because data on contaminant concentrations in piscivorous mammal tissue are minimal, we evaluated injury based on consumption of contaminated prey. Assuming a diet of 100 percent fish of all sizes

(reasonable for species such as mink and otter; EPA 1993), the fish PCB concentrations described above (ranging from 16.39 to 41.72 ppm) exceed dietary adverse effects levels for piscivorous mammals. For example, at 0.5 ppm PCBs in diet, mink experienced reduced kit body weight and increased mortality (Restum et al. 1998), and at dietary concentrations between 0.65 ppm and 0.72 ppm mink kit production and survival was reduced (Heaton et al. 1995, Platonow and Karstad 1973). This indicates that injury to piscivorous mammals has occurred (Exhibit 4-7).

**EXHIBIT 4-7 AVERAGE PCB CONCENTRATIONS IN AQUATIC RESOURCES AND CORRESPONDING ADVERSE EFFECTS THRESHOLDS (PPM)**

| RIVER SECTION | YEAR | SEDIMENT | FISH (WHOLE BODY) | TREE SWALLOW (DIET) | MALLARD (DIET) | OSPREY (DIET) | TERNS (DIET) | PISCIVOROUS MAMMALS (DIET) |
|---|---|---|---|---|---|---|---|---|
| ADVERSE EFFECTS THRESHOLD | | 0.676 PPM[1] | 5.0 PPM[2] | 10.0 PPM[3] | | | | 0.5 PPM[4] |
| Upper | 1981-1988 | 88.9 | 41.7 | 126.3 | 68.5 | 41.7 | 31.2 | 41.7 |
| | 1989-1991 | 91.4 | | 129.7 | 70.3 | | | |
| | 1992-2007 | 32.8 | 16.4 | 46.5 | 25.2 | 19.9 | 14.8 | 16.4 |
| | 2008-2012 | -- | 23.4 | -- | -- | 23.8 | 7.7 | 23.4 |
| Middle | 1981-2012 | 2.7 | 20.7 | 3.9 | 2.1 | 21.5 | 14.5 | 20.7 |
| Lower | 1981-2012 | 3.4 | 22.4 | 4.8 | 2.6 | 24.3 | 15.4 | 22.4 |

*Note:* -- Indicates no measured data available.

*Sources:* 1. MacDonald et al. (2000), 2. Monosson (1999), 3. Peakall et al. (1973), 4. Restum et al. (1998).

## Amphibians and Reptiles

Site-specific studies document exposure to and effects of PCBs on assessment area amphibians and reptiles. For example, Patnode (Personal communication as cited in EVS and NOAA 1998) found reduced snapping turtle hatching success and reduced hatchling righting response below Sheboygan Falls versus upstream reference locations. The same study also reported higher mudpuppy mortality below Sheboygan Falls than at upstream river reference locations in controlled experiments. Although these data are limited, they indicate that it is likely that injury to amphibians and reptiles in the assessment area has occurred.

### 4.4.2 INJURY TO FLOODPLAIN RESOURCES

#### Soil

Injury to soil is defined as a component of injury to geological resources, and has occurred when concentrations of a substance are sufficient to cause:

> *A toxic response to soil invertebrates (43 CFR § 11.62 (e)(9));*
>
> *Injury…to surface water, ground water, air, or biological resources when exposed to the substances (43 CFR § 11.62 (e)(11)).*

The Trustees compared contaminant concentrations in floodplain soil to literature-based thresholds for adverse effects on earthworms. Soil concentrations were calculated as the average PCB concentrations in each River section, aggregating data across all years. For studies with limited sample location information where a sample could have been taken from the Middle or Lower River, the Trustees assigned half the sample count to the Middle River and half to the Lower River. Average soil concentrations range from 3.46 to 25.69 ppm, exceeding adverse effects thresholds. For example, at soil concentrations of 6.3 ppm PCBs, exposed earthworms experienced severe, chronic immunological effects (Goven et al. 1993). This indicates that injury to soil invertebrates has occurred (Exhibit 4-8).

### Biological Resources

Applying the same definition of injury as described for aquatic biological resources, the Trustees determined injury to songbirds and small mammals.

#### Songbirds

Because data on contaminant concentrations in songbird tissue are not available, the Trustees evaluated injury based on consumption of contaminated prey. Assuming a diet of 100 percent earthworms (adapted from Poole 2013), we estimated earthworm PCB concentrations by multiplying soil PCB levels (as calculated above) with an accumulation factor of 1.58 (Hudson River Natural Resource Trustees 2010). Resulting earthworm PCB concentrations range from 5.47 to 40.6 ppm, exceeding adverse effects thresholds. For example, at approximately 10 ppm PCBs in diet, immunological changes and a reduction in number of nesting pairs, nest attentiveness, hatching, and young fledged was reported in ring doves (Tori and Peterle 1983, Peakall and Peakall 1973, Peakall et al. 1972, Friend and Trainer 1970) . This indicates that injury to songbirds has occurred (Exhibit 4-8).

#### Small Mammals

Site-specific studies document exposure of small mammals to PCBs in the assessment area. For example, WDNR (2013b) reported average PCB concentrations in small mammals ranging from 0.027 ppm (jumping mouse) to 2.91 ppm (short-tailed shrew).

Because minimal data on contaminant concentrations in small mammal tissue are available, we evaluated injury based on modeled body burdens. We multiplied soil PCB levels (as calculated above) with a biota-soil accumulation factor of 1.22 (Hudson River Natural Resource Trustees 2010). Resulting small mammal concentrations range from 4.22 to 31.35 ppm, exceeding adverse effects thresholds. For example, at concentrations greater than 0.05 ppm PCBs small mammals experienced adverse physiological effects such as reductions in bone density (Johnson et al. 2009). This indicates that injury to small mammals has occurred (Exhibit 4-8).

**EXHIBIT 4-8 AVERAGE PCB CONCENTRATIONS IN FLOODPLAIN RESOURCES AND CORRESPONDING ADVERSE EFFECTS THRESHOLDS (PPM)**

| RIVER SECTION | YEAR | SOIL | SMALL MAMMALS (WHOLE BODY) | SONGBIRD (DIET) |
|---|---|---|---|---|
| ADVERSE EFFECTS THRESHOLD | | 6.3 PPM[1] | 0.05 PPM[2] | 10.0 PPM[3] |
| Upper | 1981-2010 | 25.7 | 31.4 | 40.6 |
| Middle | 1981-2012 | 19.2 | 23.5 | 30.4 |
| Lower | 1981-2012 | 3.5 | 4.2 | 5.5 |
| *Sources:* 1. Goven et al. (1993), 2.Johnson et al. (2009), 3.Peakall et al. (1973). | | | | |

## 4.5 HUMAN USE OF NATURAL RESOURCES AND SERVICES

In addition to ecological services, natural resources also provide a suite of human use services, including recreational fishing, boating, and waterfowl hunting. For the Sheboygan River NRDAR the Trustees are focusing on changes in recreational fishing and boating, as data are not sufficient to evaluate the potential decrease in waterfowl hunting as a result of waterfowl consumption advisories.[6]

### 4.5.1 RECREATIONAL FISHING

Fish consumption advisories (FCAs) associated with PCB contamination have been in place on the River since 1979 (WDNR 1979-2012). This constitutes an injury to a biological resource (i.e., fish) under the DOI NRDAR regulations (43 CFR § 11.62 (f)(1)(iii)). From 1979 to 1984, the Wisconsin Fishing Regulations, published by WDNR, contained a Wisconsin Division of Health "do not eat" advisory for fish from the River. From 1985 onwards, trout and salmon followed the Lake Michigan advisory, which has become more specific over time. For example, the 2012 advisory recommended:

- Eat no more than 1 meal/week: Rainbow Trout (0-22"), Smelt, Yellow Perch (0-11").
- Eat no more than 1 meal/month: Brown Trout (0-28"), Chinook Salmon, Chubs, Coho Salmon, Lake Trout (0-25"), Lake Whitefish, Rainbow Trout (22+"), Yellow Perch (11+").
- Eat no more than 1 meal every 2 months: Brown Trout (28+"), Lake Trout (25-29").
- Do not eat: Lake trout (29+").

Resident fish species have remained under a "do not eat" advisory (WDNR 1979-2012). Exhibit 4-9 provides a timeline of the advisories.

[6] WDNR has a "do not eat" advisory on mallard ducks using the waters of the River and on lesser scaup using the waters of Sheboygan Harbor (WDNR, 2012). These advisories are injuries under the DOI NRDAR regulations (43 CFR Section 11.62 (f)(1)(iii)). Hunters are aware of the advisory and there has been a general decrease in hunting (D. Katsma, Personal communication). However sufficient data are not available to evaluate any related decrease in waterfowl hunting in the assessment area, and the cost of obtaining such data is likely to be greater than the potential losses incurred by hunters.

The Trustees determined that anglers likely experienced a reduction in the value those anglers hold for fishing on the lower 14 miles of the Sheboygan River. These losses are expected to occur in four categories of recreational fishing:

1) Diminished angler trips (i.e., trips still taken to the assessment area but of lower quality) and foregone (i.e., trips not taken at all) trips due to the presence of FCAs for trout and salmon;
2) Diminished and foregone angler trips due to the presence of FCAs for resident species (e.g., walleye, northern pike, and smallmouth bass);
3) Reduced angler effort due to the suspension of salmon stocking in the River from 1987 to 1993; and
4) Reduced angler effort due to remedial activities in 2011 and 2012.

### 4.5.2 RECREATIONAL BOATING

Remedial activities occurring between 2011 and 2012 have discouraged recreational boating in the River. For example, remedial activities closed the 8th Street boat ramp and discouraged boating elsewhere on the River as shown in Exhibit 4-10 (C. Pelishek, Personal communication). This impacted boaters' ability to participate in that activity, causing a loss.

**EXHIBIT 4-9 TIMELINE OF FISH CONSUMPTION ADVISORIES ON THE RIVER**

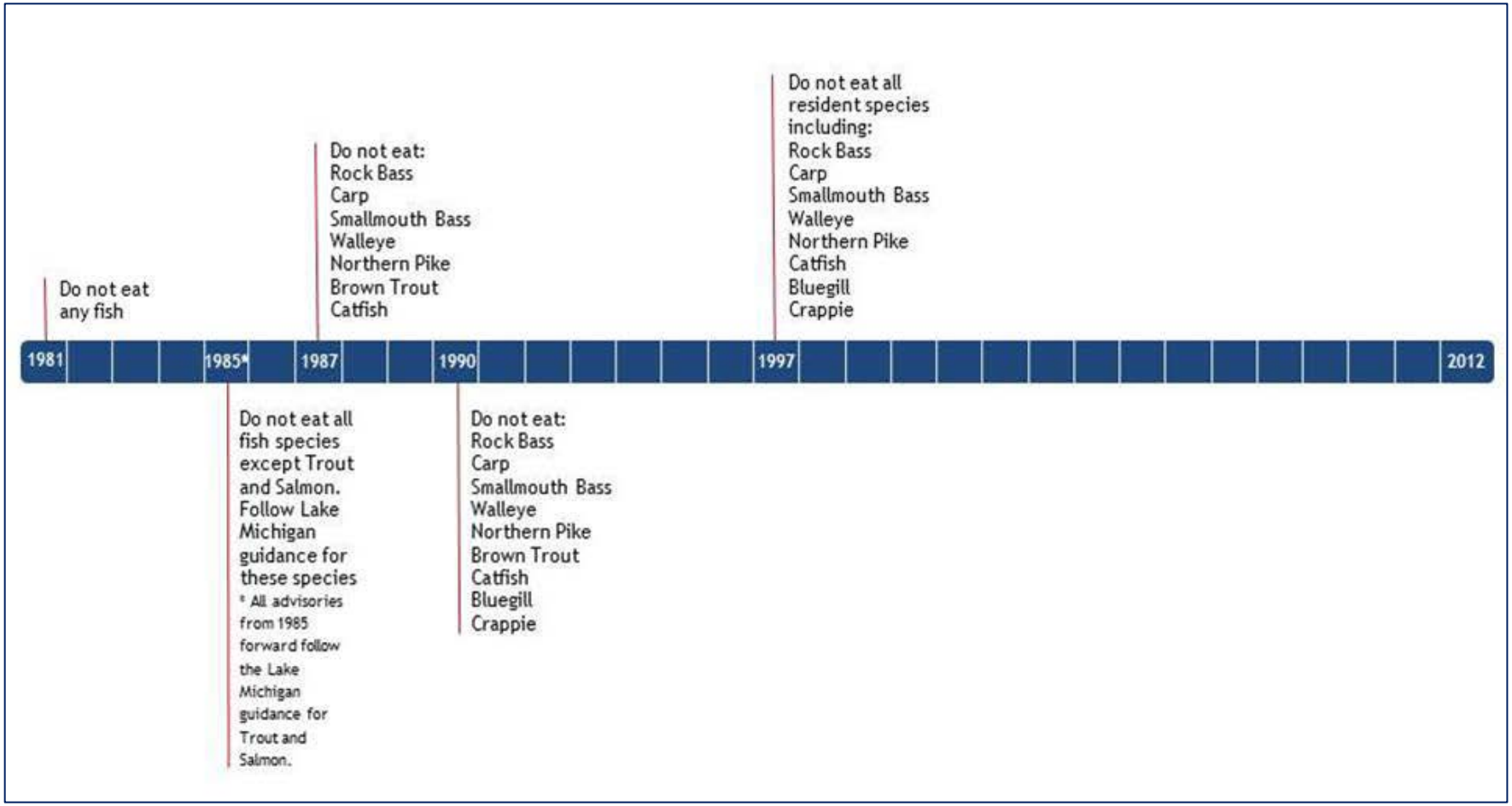


**EXHIBIT 4-10 RECREATIONAL BOATING ADVISORY**

*Photo credit:* Robert Paterson

# CHAPTER 5 | TRUSTEE VISION FOR RESTORATION AND PROPOSED RESTORATION ALTERNATIVES

As stated in Chapter 1, the purpose of this draft RP/EA is to describe how the Trustees for the Sheboygan River NRDAR will use natural resource damage funds for the restoration of natural resources and services injured by the release of hazardous substances at the Sheboygan River and Harbor Site. Consistent with the federal NRDA regulations and NEPA, this draft RP/EA evaluates reasonable restoration alternatives and identifies a preferred alternative, informing the public as to the types and scale of restoration that are expected to compensate for injuries to natural resources. As summarized in Chapter 4, the Trustees have determined that injuries have occurred to natural resources that utilize aquatic and floodplain habitats and provide ecological and/or recreational services. Therefore, the Trustees are evaluating restoration alternatives that will provide benefits that are linked directly to potentially injured natural resources or related service losses, and would not otherwise be generated (i.e., but for NRDAR funding the project would not occur within a reasonable timeframe).

After applying these restoration prioritization characteristics, the Trustees also consider whether the projects that would be considered under each alternative are consistent with the restoration planning guidance in the federal NRDA regulations (43 CFR §11.82 (a)) and the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*). For example, the DOI NRDA regulations list ten factors to consider when evaluating a preferred alternative (43 CFR § 11.82 (d)) (see also the Trustee fact sheet on restoration (Trustees 2013)):

- Technical feasibility,
- The relationship of the expected costs of the proposed actions to the expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources,
- Cost effectiveness,
- The results of actual or planned response actions,
- Potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other services,
- The natural recovery period,
- Ability of the resources to recover with or without alternative actions,
- Potential effects of the action on human health and safety,
- Consistency with relevant federal, state, and tribal policies, and,
- Compliance with applicable federal, state, and tribal laws.

The Trustees are evaluating three restoration alternatives, described in detail below.

## 5.1 ALTERNATIVE A: NO ACTION

Under Alternative A, the "No Action Alternative," no restoration actions would be conducted during or after remediation is completed. Remedial actions designed to protect human health and the environment from unacceptable risk will be completed as directed by state and federal authorities. However, these remedial requirements are not expected to immediately return natural resources to baseline ecological conditions (i.e., conditions but for the release of COCs). Natural resources will likely take years to attenuate to baseline contaminant concentrations (e.g., PCBs) after remedial actions are completed, given the continued presence of the contaminants within the system.

Similarly, the "No Action Alternative" is not expected to compensate the public for interim ecological and human use service losses (i.e., losses that occurred pre-remedy and extend until COC concentrations return to baseline) due to COCs released into the assessment area. Remedial actions, which focus solely on removal or containment of contamination, reduce future injury but do not restore natural resources to their baseline conditions and do not make the public whole.

Lastly, the "No Action Alternative" would not utilize settlement monies for restoration or acquisition of the equivalent of lost resources and resource services, which is the purpose of the NRDAR. Therefore, the "No Action Alternative" serves as a point of comparison to determine the context, duration, and magnitude of any environmental consequences that might result from the implementation of other restoration actions.

## 5.2 ALTERNATIVE B: RESTORATION WITHIN THE ASSESSMENT AREA

Alternative B, "Restoration within the Assessment Area," is expected to provide natural resource services similar to the services that the injured habitat would have provided but for Site-related contamination. Restoration actions under this Alternative would be creating *additional* natural resource services as compensation for losses, as these projects are not otherwise required or funded. This Alternative would increase habitat quality and quantity, promote habitat connectivity, create new public use opportunities and improve existing use options, and benefit Trust natural resources specifically within the injured ecosystem. This Alternative would focus on projects solely within the assessment area, that is, the lower 14 miles of the Sheboygan River (which includes the Inner Harbor) and associated floodplain (Exhibit 4-1).

There are a variety of projects that can be implemented within the assessment area to restore ecological and recreational services. Natural resources potentially benefited by these habitat restoration projects include surface water, sediments, aquatic invertebrates, fish, birds, reptiles, amphibians and mammals. Project types, described more fully below, would include wetland and riparian restoration; wetland, riparian, and ecologically-associated uplands preservation; and recreational fishing enhancement projects.

Projects considered under Alternative B are consistent with the restoration factors outlined in the NRDA regulations. For example, habitat and wildlife restoration and public use projects within the Sheboygan River assessment area are technically feasible, cost effective, and will be specifically targeted to benefit multiple, relevant natural resources that utilize aquatic and associated upland habitat. The Trustees plan to apply methods that have been successful in other locations to increase the probability of project success, building on remedial-related actions completed to-date.

Available settlement funds, restoration opportunities, and restoration costs will influence the scale and scope of projects implemented in each category. However, the Sheboygan River AOC overlaps with the assessment area, and a suite of restoration/mitigation projects have already been implemented or funded as part of AOC efforts. This greatly limits the potential for undertaking additional restoration projects specifically within the assessment area. Preservation of Willow Creek (Section 5.3.1) is the one potential action identified to-date within the City of Sheboygan, and could be accomplished under this Alternative. However, the Trustees' experience indicates that sufficient additional project opportunities are not available within the assessment area.

### 5.2.1 WETLAND RESTORATION PROJECTS

The restoration of wetland habitats would include a variety of actions to rehabilitate, reestablish, and enhance wetlands and associated uplands to increase ecological quality, diversity, and function. For example, wetland habitat restoration projects may provide increased nesting and food for a wide variety of fish, birds and other wildlife, providing ecological services similar to those injured by PCBs. Within this restoration category, the Trustees would target areas impacted by modification of natural wetland habitats, floodplains that offer minimal flood or water quality protection, wetland and/or upland areas with minimal connectivity and impaired ecological function, and degraded wetland and upland habitats adjacent to existing natural areas. The Trustees believe these techniques are more effective and successful than wetland or habitat creation where wetlands or associated upland habitats have not previously existed.

The Trustees' wetland and upland habitat reestablishment and enhancement strategy primarily will include, but not be limited to, low impact techniques such as reestablishing wetland plants and other native vegetation in order to reestablish natural characteristics that have been eliminated. The Trustees would also consider projects that increase the diversity and quality of wetland and associated upland habitats through removal of invasive species and re-vegetation with native plants. Techniques will likely focus on physical removal. That is, plants may be removed by digging, pulling, mowing, or cutting, which are often done by hand. However, some herbaceous and woody plants may require mechanical removal with chainsaws, mowers, or other machinery (NOAA 2015b). Revegetation techniques will focus on preparing the seedbed by tilling or plowing; seeding or planting by hand or with mechanical equipment; and installing seeds, plants, or woody materials such as trees and shrubs.

The Trustees would also consider implementing restoration projects that involve the installation of water control structures to manage water levels, breaking or removing drain tile, site re-grading, construction of berms, and other wetland restoration techniques to restore natural hydrology. For example, "[w]ater control structures (i.e., tide gates and weirs) are appropriate for project sites where strict management of water levels is required (i.e., mosquito management, flood control, and migratory fowl habitat) or seasonal impacts require the complete control of water regimes for…water level, timing (seasonal objectives), or biological controls…Grading may be required in sites where excess sediments have been deposited, leaving the site at elevations inappropriate for wetland function. In impounded areas, it might actually be necessary to supply additional sediments because compaction of the sediment over time often results in lower elevation than required to support wetland vegetation" (NOAA 2015b p.54). Grading would likely be done with heavy machinery to roughly prepare an area (e.g., earth moving, tilling, and compaction) and then using a grader to finish the surface.

### 5.2.2 RIPARIAN RESTORATION PROJECTS

The Trustees would consider projects that achieve the reestablishment or enhancement of aquatic and riparian habitat along the Sheboygan River and its tributaries that have been injured by the release of hazardous substances. Resources that utilize these habitats have been further impacted by encroachment and habitat fragmentation caused by land use changes and development. The Trustees recognize the importance of aquatic and riparian habitat to the overall health of the Sheboygan River ecosystem.

Specific aquatic habitat quality improvement projects may include reestablishing or enhancing riverine and stream corridors with native vegetation, restoring natural stream flow and stabilizing stream banks, improving native fish spawning and rearing by incorporating woody structure, or replacing culverts to improve native fish passage. For example, projects may include planting native vegetation using manual methods or heavy equipment. Bank restoration and erosion reduction activities could include installation of wildlife structures (e.g., conifer/hardwood snags, brush piles, avian nest boxes and platforms, turtle basking logs) and/or in-stream installation of woody debris (e.g., root wads, engineered log jams, logs, tree limbs) (NOAA 2015b). “Culverts are installed in areas where water flow has been restricted but passage over the flow point is still required (e.g., roads and walking paths). Multiple culverts can be strategically placed around the site or grouped together. For shallow-water sites with the goal of re-establishing sheet flow, multiple smaller pipes are sometimes installed because they more effectively mimic sheet flow characteristics” (NOAA 2015b p.54). Where perched culverts or excessive woody debris and snags inhibit fish passage, the structure or blockage could be removed. In the case of a culvert, it could also be replaced with a bottomless structure or one with larger opening to assure the unimpeded movement of fish through the area. Projects may include enhancement of upland areas adjacent to riparian habitat as necessary to ensure successful restoration of the aquatic ecosystem.

### 5.2.3 WETLAND, RIPARIAN, AND ECOLOGICALLY ASSOCIATED UPLANDS PRESERVATION

The Trustees would consider projects that may preserve wetland, riparian, and ecologically-associated upland habitats essential to a variety of fish and wildlife species, including species that are the same as or similar to those injured by PCB releases along the Sheboygan River. Habitats may be preserved through land acquisition, land donations and/or transfers, or conservation easements. Preservation may also include protection of upland areas adjacent to wetlands and riparian areas as necessary to ensure protection and/or enhancement of the aquatic ecosystem.

Final selection of specific lands that will be preserved would include consideration of factors such as the ecological value of the wetland and riparian habitats, Trustee resource management priorities, inherent improvement of water quality, ownership/protection opportunities, geographic/ecological diversity, local/regional planning, citizens' concerns, and the ability to find willing sellers. Land acquired would be deeded to individual state, tribal, federal, or local governments, land trusts, or conservation non-governmental organizations in accordance with relevant procedures and standards set for each governmental entity. The primary purpose of these preservation efforts is to protect fish and wildlife habitats. Therefore, in some instances it may be necessary to restrict public access to portions of the acquired properties to protect these resource functions.

### 5.2.4 RECREATIONAL FISHING ENHANCEMENT PROJECTS

This category of projects includes actions that enhance recreational fishing opportunities in riparian and riverine habitats. Projects in this category are intended to compensate for recreational fishing losses caused by PCB releases to the Sheboygan River. For example, restoration actions may include improvement of recreational fishing opportunities through construction of boat launches or ramps, trails or bridges that promote access, shoreline fishing piers and access points, and educational signage.

These facilities provide public use and enjoyment related to habitats that are similar to those impaired by the presence of PCBs in and around the Sheboygan River. Projects may include upgrading existing facilities or the construction of new amenities at existing facilities within the area. The Trustees would also consider land acquisition and/or easements (see Section 5.2.3) to ensure access to the facilities and associated resources. Where possible, the Trustees would develop projects that are associated with and/or complementary to ecological projects, while protecting and maintaining the ecological integrity of a site.

## 5.3 ALTERNATIVE C: RESTORATION WITHIN AND BEYOND THE ASSESSMENT AREA

Alternative C, "Restoration within and Beyond the Assessment Area," is expected to provide natural resource services similar to the services that the injured habitat would have provided but for Site-related contamination. Similar to Alternative B, actions under this Alternative would be creating *additional* natural resource services as compensation for losses, as these projects are not otherwise required or funded. Restoration projects implemented under this Alternative would increase habitat quality and quantity, promote habitat connectivity, create new public use opportunities and improve existing use options, and benefit natural resources specifically within the injured ecosystem. This Alternative would focus on projects within the Sheboygan River Basin within Sheboygan County, providing natural resource benefits within the broader basin while maintaining a focus on proximity to injured resources (Exhibit 5-1).

The types of restoration projects that the Trustees would consider implementing under Alternative C are consistent with those described under Alternative B (i.e., wetland and riparian restoration; wetland,

riparian, and ecologically-associated uplands preservation; and recreational fishing enhancement projects), however such projects could be implemented within and *beyond* the assessment area. These projects would benefit surface water, sediments, aquatic invertebrates, fish, birds, reptiles, amphibians and mammals, and would provide relevant ecological and recreational services. The Trustees expect that projects under Alternative C will be consistent with the restoration factors outlined in the NRDAR regulations; have the potential to compensate the public for natural resources injuries by providing additional, similar services in the future; and will be implemented using methods that have been successful in other locations to increase the probability of project success, building on remedial-related actions completed to-date.

At this time, the Trustees are confident that sufficient restoration opportunities are available under this Alternative. For example, streams and tributaries directly connected to or in close proximity to the assessment area include Willow Creek, Weedens Creek, Pigeon River and Black River. Additionally, the Trustees are proposing two specific projects, Amsterdam Dunes Preservation and Restoration and Willow Creek Preservation and Restoration, each of which incorporate many of the proposed restoration project types.

### 5.3.1 WILLOW CREEK PRESERVATION AND RESTORATION

The Willow Creek Preserve, also known as the former Schuchardt Farms property, is approximately 140 acres located within the City of Sheboygan (Exhibit 5-2; Appendix A). Willow Creek Preserve is a unique natural feature within an urban environment due to its size, habitats, and natural features. Supporting a diverse habitat mix, including upland forest/shrub, wetland forest, shrub/sedge meadow, riparian corridors along Willow Creek and the Sheboygan River, and scattered cropland, conservation of Willow Creek has been identified as a high priority for maintaining and improving fish and wildlife populations and habitat in the Sheboygan River area. For example, the Sheboygan River AOC Fish and Wildlife Technical Advisory Committee identified Willow Creek as a high priority area for conservation during planning for removing “degradation of fish and wildlife populations” and “loss of fish and wildlife habitat” BUIs (GRAEF et al. 2011). Willow Creek Preserve is considered an Area of Special Natural Resource Interest,[7] and in 2011, the City of Sheboygan developed a Conservation Plan for the property, which describes current and potential conditions (GRAEF et al. 2011). The property provides a critical link in the habitat of the Sheboygan River, serving as an oasis in an otherwise urban area.

[7] Areas of Special Natural Resource Interest include designated state natural areas, designated trout streams, waters or portions of waters inhabited by any endangered, threatened, special concern species or unique ecological communities identified in the Natural Heritage Inventory.

**EXHIBIT 5-1 GEOGRAPHIC SCOPE OF RESTORATION AREA UNDER ALTERNATIVE C**

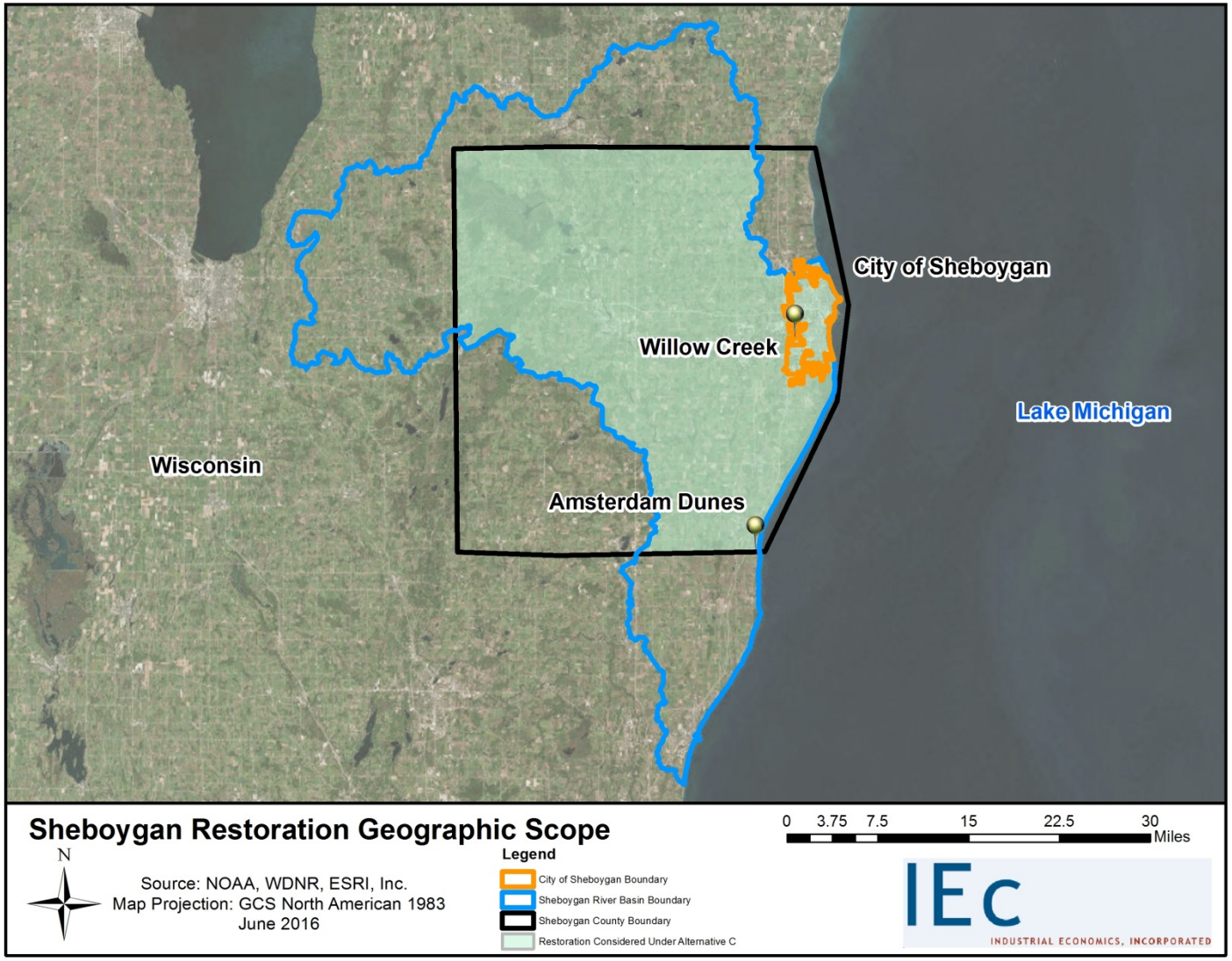


*Photo credit:* Mary Buckman

Because of its location and ecological attributes, protection and restoration of Willow Creek Preserve directly benefits the natural resources and resource services that were injured by PCBs and PAHs. For example, the property supports:

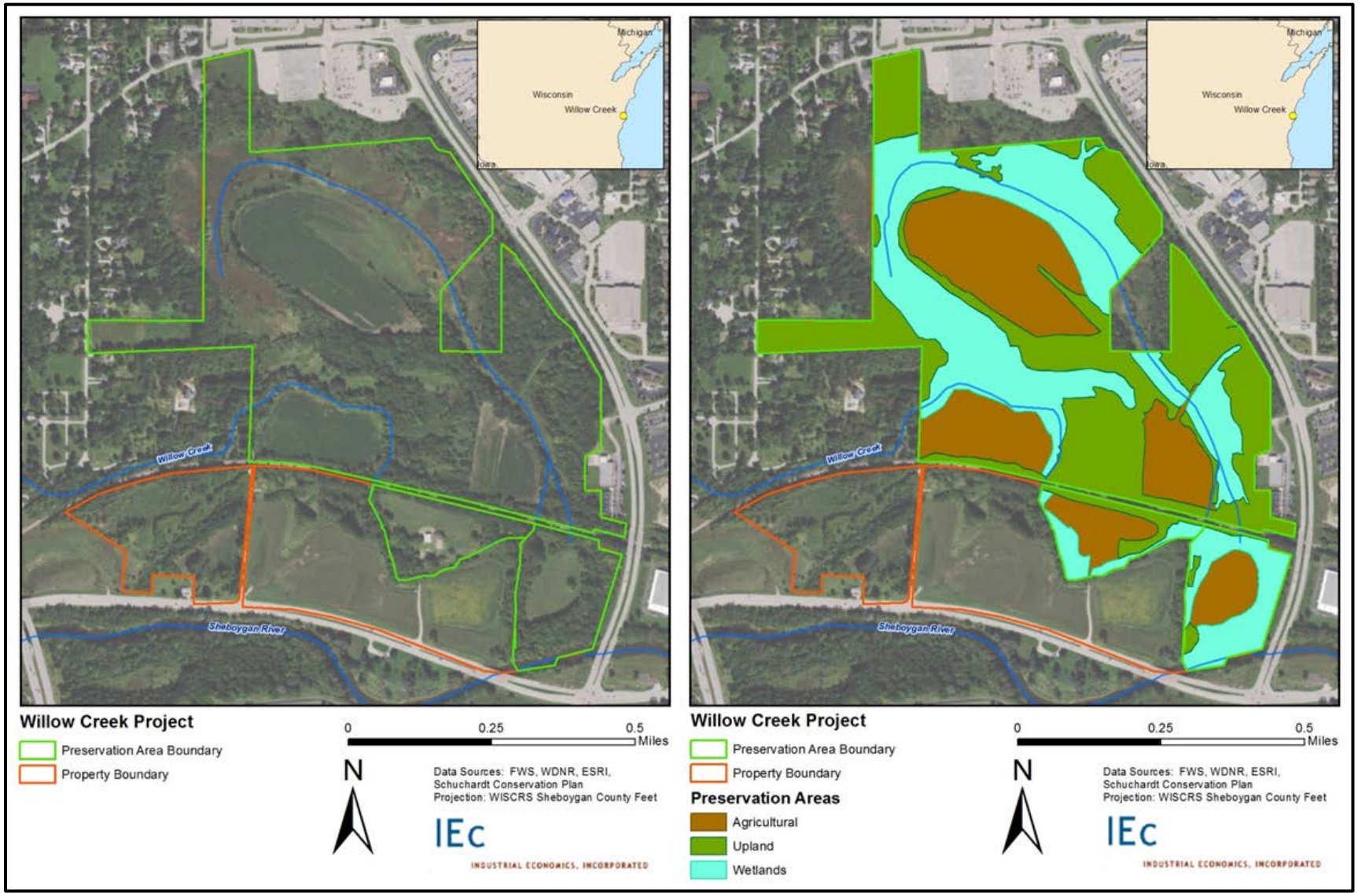
- The last remaining large block of intact forest and wetland habitat in the lower Sheboygan River, crucial in restoring the Sheboygan River AOC's resident and migrating fish and wildlife populations.
- A class II trout stream (Willow Creek) and associated watershed. This stream is the only stream on Lake Michigan's western shore known to support three species of naturally reproducing salmon and trout.
- Rare plant and animal species.
- Opportunities for habitat restoration benefiting a broad variety of wildlife species, but especially significant for migratory birds.
- Stormwater retention and groundwater recharge.
- Historic and cultural sites (e.g., Native American archeological sites, 1950s railroad).

Assessments of Willow Creek Preserve by entities such as the Glacial Lakes Conservancy and local, state, and federal agencies have also identified potential restoration options within the property that are consistent with the Conservation Plan and the restoration project types described in this Alternative (e.g., Jung and Beyer 2014). These include, but are not limited to:

- Wetland restoration,
- Restoration of agricultural land to native prairie/oak savannah,
- Improvement of fish passage,
- Channel naturalization,
- Riparian corridor restoration and invasive species control, and
- New and improved opportunities for recreation, including nature trails, parking, fishing access, and interpretive signage.

Therefore, the Trustees propose to provide between $350,000 and $450,000 to the City of Sheboygan to enable the transfer (contingent upon City Council approval) of the Willow Creek Preserve from the City to the Glacial Lakes Conservancy (GLC), a private, non-profit land conservation organization in the Sheboygan area. GLC has agreed to grant a conservation easement to WNDR, which will afford protection of the property from development in perpetuity. The Trustees will also provide GLC with funding to support the management and preservation of the property. The Trustees may propose restoration projects within the Willow Creek Preserve in future restoration plans based upon the restoration project types included in Alternative C.

**EXHIBIT 5-2 WILLOW CREEK RESTORATION AND PRESERVATION PROJECT AREA**



### 5.3.2 AMSTERDAM DUNES PRESERVATION AND RESTORATION

Amsterdam Dunes is a combination of properties abutting Lake Michigan within the Sheboygan River Basin, just north of the Ozaukee-Sheboygan County line (Exhibit 5-3; Appendix B). The total acreage of the parcels is 328 acres, including shoreline, wetlands, managed forest, bluffland, and cropland. Because of its lake-front acreage, proximity to growing cities such as Milwaukee and Chicago, potential access from existing highways, and favorable zoning, Amsterdam Dunes is under substantial development pressure. The entire parcel was acquired for conservation purposes by Sheboygan County. A conservation easement and deed restriction for preservation of 184 acres (the relevant portion of the site) is presently in effect (Appendix B). The Trustees propose amending the existing conservation easement, held by GLC, to provide FWS a third party right of enforcement.

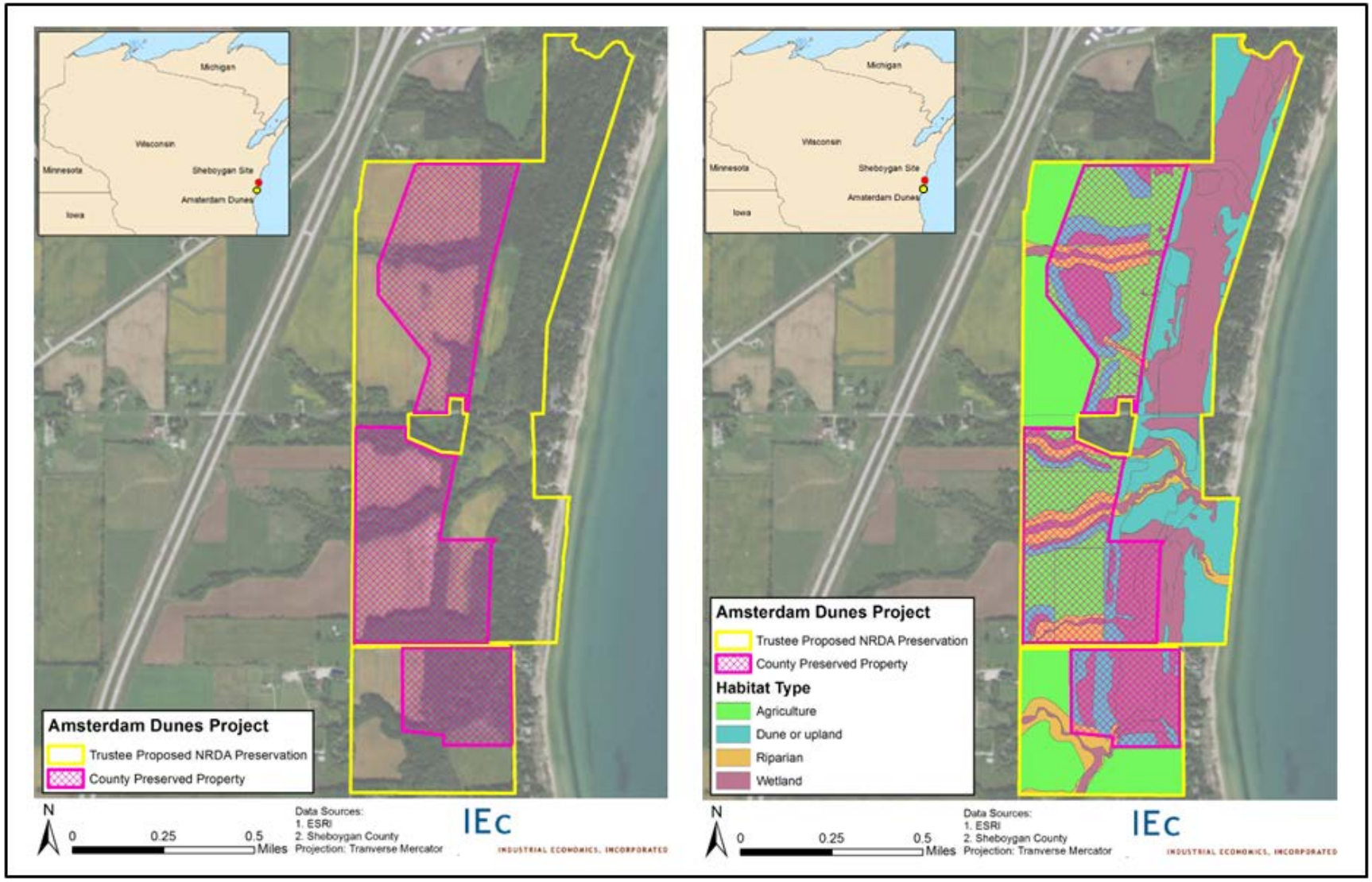
Amsterdam Dunes is a place of rare habitats and organisms, and consists of remnants of ecologically significant lands and waters that have largely disappeared from Wisconsin's landscape, such as:

- Lake Michigan shoreline dune ecosystem community, which is essential for a variety of threatened or endangered species (e.g., Pitcher thistle, thick-spiked wheat grass).
- Wetlands, both coastal and inland, which improve water quality, assist in flood control, and support a variety wildlife species, especially waterfowl and raptors due to the well-established migratory corridor along Lake Michigan.

*Photo credit:* Glacial Lakes Conservancy

- A glacial relic, the shoreline remnant of 6,000-year-old Lake Nipissing.
- Inter-dunal wetlands (wet areas or seasonal ponds found between sand dune formations), which are considered by the state's Bureau of Endangered Resources to be one of the rarest of all habitats in Wisconsin.
- Native Maple-Beech forest, of which only isolated stands still exist in Wisconsin.
- Southern mesic forest, as Sheboygan County is one of the last remaining areas where these forests will thrive due to climate and unique soils.
- Significant, additional, and contiguous Lake Michigan shoreline habitat for migratory bird populations because of Amsterdam Dunes' adjacency to the DNR's Hawk Banding Preserve.

**EXHIBIT 5-3 CURRENT HABITATS IN AMSTERDAM DUNES PRESERVATION PROJECT AREA**



In addition, preservation of Amsterdam Dunes conforms to provisions in the Sheboygan County Comprehensive Outdoor Recreation and Open Space Plan and the Sheboygan County Natural Areas and Critical Resources Plan, which both address the need for protecting crucial environmental corridors and areas of significant ecological significance. The South East Wisconsin Regional Planning Commission proposed that major areas of this property be designated as critical species habitats or significant natural areas.

Finally, the Trustees have worked with Sheboygan County to identify potential restoration options within Amsterdam Dunes. These include, but are not limited to, invasive species management, restoration of wetland hydrology, stream habitat improvements, planting native species, and conversion of agricultural land to more ecologically valuable habitat.

As part of this draft RP/EA, the Trustees support additional conservation measures through a separate contract between Tecumseh and Sheboygan County, wherein the County will receive $1,295,500 to contribute to the County's acquisition and preservation of Amsterdam Dunes. Other restoration projects for Amsterdam Dunes may be suggested in future restoration plans based upon the restoration project types included in Alternative C.

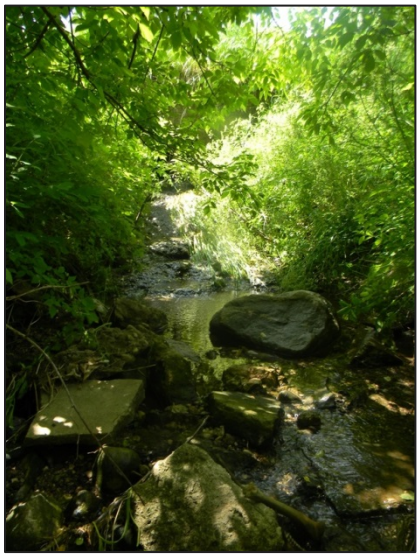


*Photo credit:* Glacial Lakes Conservancy

# CHAPTER 6 | ENVIRONMENTAL ASSESSMENT AND PREFERRED NRDA RESTORATION ALTERNATIVE

The Trustees' primary goal in this chapter is to evaluate the consequences of the Alternatives described in Chapter 5. This evaluation will assist the Trustees in identifying a preferred restoration alternative that compensates the public for natural resource injuries and associated losses resulting from PCB releases along the Sheboygan River by determining whether implementation of any of the alternatives may significantly affect the quality of the human environment, particularly with respect to the physical, biological, socio-economic, or cultural environments of the Sheboygan River and associated watershed within Sheboygan County.

## 6.1 ASSESSMENT OF ENVIRONMENTAL CONSEQUENCES

Actions undertaken to restore natural systems may have beneficial and/or adverse impacts to the physical, biological, socio-economic, and cultural environments. In order to determine whether an action has the potential to result in significant impacts, the context and intensity of the action must be considered, as provided in 40 CFR 1508.27. Context refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). Intensity refers to the severity of impact and could include factors such as the timing of the action (e.g., more intense impacts would occur during critical periods like wildlife breeding/rearing, etc.), the effect on public health and safety, and cumulative impacts. Intensity is also described in terms of whether the impact would be beneficial or adverse.

In the analysis below, the Trustees examine the likely beneficial and adverse impacts of each restoration alternative on the quality of the human environment, including context and intensity. If the Trustees conclude that the actions associated with the preferred alternative will not lead to significant impacts, then the Trustees will issue a FONSI. If significant impacts are anticipated, the Trustees will proceed with an EIS to evaluate a reasonable range of restoration alternatives and the environmental consequences of those alternatives. The Trustees will continue to evaluate environmental impacts as specific projects are implemented. The following sections evaluate anticipated environmental consequences of the restoration alternatives in light of the ten NRDAR factors described in Chapter 5.

### 6.1.1 SCOPE OF THE NEPA ANALYSIS

This RP/EA describes and compares the potential impacts of the proposed restoration alternatives, including the No Action Alternative, for the Sheboygan River NRDAR. In particular, this RP/EA analyzes the potential direct, indirect, and cumulative ecological, social, and economic impacts associated with each alternative. The following definitions were used to generally characterize the nature of the various impacts:

- *Short-term or long-term impacts:* This characterization is determined on a case-by-case basis. Rather than referring to a specific timeframe, short-term impacts are expected to occur for a finite period, whereas long-term impacts are those that are more likely to be persistent.

- *Direct or indirect impacts:* A direct impact caused by a proposed action occurs at or near the action's location, whereas an indirect impact occurs later in time or at a more distant location. For example, streambank erosion may directly impact the water quality of the adjacent section of river, and may indirectly impact fish use of the downstream portion of the river because of the increased sediment load.
- *Minor, moderate, or major impacts:* These relative terms characterize the expected magnitude of an impact. Minor impacts may be perceptible but are sufficiently small such that they are not typically measurable. Moderate impacts are more perceptible and more likely to be quantified or measured. Major impacts are expected to be of sufficient intensity within a particular context (e.g., the affected region (40 CFR 1508.27)) such that an evaluation of the need for mitigation under NEPA is warranted.
- *Adverse or beneficial impacts:* An adverse impact has an unfavorable or undesirable outcome on the environment (artificial or natural), whereas a beneficial impact has positive outcomes on the environment. A single action may result in adverse impacts on one environmental resource and beneficial impacts on another resource.
- *Cumulative impacts:* NEPA regulations define cumulative impacts as the "impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

## 6.2 EVALUATION OF ALTERNATIVE A: NO ACTION

The "No Action Alternative" would not initiate any restoration action outside of currently funded programs. Instead, the ecosystem would attenuate to background conditions based on natural processes only, with no assistance from active environmental restoration.

Although the lack of action makes this Alternative technically feasible and cost effective, this Alternative:

- Does not restore injured resources to baseline. Remediation is expected to include years of monitoring after sediment removal actions are completed, but lack of restoration beyond remedial actions will reduce the potential for resources to fully recover to baseline conditions.
- Does not compensate the public for interim losses. Habitat quality would not be improved above baseline, wildlife would continue to be injured due to PCBs, and recreational fishing and boating opportunities would not improve or increase.
- Is not consistent with federal and state policies and laws. Under this Alternative, the available settlement monies that are meant to be directed toward NRDA restoration actions would not be spent in that manner.

While the "No Action Alternative" does not *create* additional adverse impacts to the environment, it also does not provide the ecological, recreational, and socio-economic benefits described in the other alternatives. Given the long timeframe of natural PCB attenuation after sediment removal actions conclude, under the "No Action Alternative", adverse environmental consequences from PCBs (i.e.,

ecological and human use injuries) are expected to continue into the future and would not be mitigated through restoration actions. That is, the "No Action Alternative" may result in adverse impacts to fish and other wildlife, as well as reductions in the ecological and human use services provided by riverine and floodplain habitats, due to the lack of additional habitat functionality provided through restoration and/or preservation actions in Sheboygan River area. Therefore, the "No Action Alternative" is not a favorable restoration alternative when evaluated against the NRDA factors. This Alternative serves as a point of comparison to determine the context, duration, and magnitude of environmental consequences resulting from the implementation of other alternatives.

## 6.3 EVALUATION OF ALTERNATIVE B: RESTORATION WITHIN THE ASSESSMENT AREA

Alternative B, "Restoration within the Assessment Area," is expected to provide relevant natural resource services through implementation of projects solely within the assessment area (i.e., the lower 14 miles of the Sheboygan River and associated floodplain). Under this Alternative, project types include wetland and riparian restoration; wetland, riparian, and ecologically-associated uplands preservation; and recreational fishing enhancement projects.

To provide a direct comparison to Alternative A, the Trustees evaluated Alternative B for consistency with the DOI NRDA restoration factors, provision of natural resource services at or above baseline, compliance with relevant regulations, and net environmental consequences.

Projects under Alternative B have the potential to compensate the public for natural resources injuries by providing additional, similar services in the future. Projects may either allow resources to more rapidly achieve baseline, or may improve resource conditions such that the habitat or resource provides services above and beyond baseline. For example, habitat creation and restoration activities provide natural resource services similar to the assessment area's baseline services. Restored wetlands and riparian areas provide habitat for spawning fish and migratory birds, improve water quality by filtering sediments and pollutants from the water column, reduce erosion, and export detritus. These actions influence increased production of forage fish populations, which provide prey for piscivorous fish, birds, reptiles, and mammals. Preservation actions such as land acquisition and conservation easements protect ecologically important habitat from current and future land development. Restoration of wetland, upland, and riparian habitats has the potential to increase habitat connectivity throughout the restoration area, which is important in providing ecological services similar to those lost.

Finally, the cumulative environmental consequences of Alternative B are expected to be beneficial to natural resources injured as a result of the release of hazardous substances. Below, we assess the potential environmental consequences of each of the proposed project types. Adverse impacts to environmental justice and/or socioeconomic factors are expected to be minimal and may be mitigated during project selection (e.g., through project scope, location, or access). Any unavoidable adverse impacts will be minimized through individual project plans, and are expected to be far outweighed by the beneficial impacts of projects under this Alternative. Additional NEPA analysis will be completed if future specific projects within the categories described below have expected adverse effects beyond the scope of those analyzed here.

### 6.3.1 WETLAND AND RIPARIAN RESTORATION

Wetland and riparian restoration creates the desired elevation and hydrology for wetland/riparian vegetation and fish habitat. As described in Sections 5.2.1 and 5.2.2, this project category includes, but is not limited to, the following actions: planting, installation of water control structures, revegetation, breaking or removing drain tile, site re-grading, bank restoration, and erosion reduction. These actions are expected to cause minor, short-term, localized impacts to existing resources and resource services, and result in moderate long-term benefits across a broad geographic scope. For example, wetland and riparian planting may cause short-term, localized impacts to existing vegetation at the restoration site (e.g., as existing vegetation is trampled or removed). During planting, the resource services provided by that area are likely to be reduced through physical disturbance. However, long-term, moderate beneficial impacts to water resources and associated flora and fauna would occur due to the reduced erosion and increased shelter provided by wetland and riparian plants. "Planting activities would [also] result in beneficial impacts by restoring or creating wetland and/or shallow-water habitats that provide areas for feeding and shelter for fish, as well as nutrient cycling and carbon sequestration and storage capacity…Minor beneficial impacts related to socioeconomic resources may result from increased tourism opportunities that could develop around an improved resource" (NOAA 2015b p.156).

Installation or modification of water control structures would cause direct and indirect short-term, localized, minor adverse impacts on a suite of natural resources such as sediment and aquatic biota. "The use of heavy machinery and construction equipment is the primary cause of the direct, adverse impacts associated with this activity, which may include soil compaction, emissions from heavy equipment, removal or crushing of understory vegetation, increased soil erosion in the immediate area of construction operations, and unintentional introduction of non-native, potentially invasive, species" (NOAA 2015b p.151). Some impacts may also occur to vegetation that becomes inundated once the water control structure is in place. However, the moderate long term direct and indirect benefits expected from this type of restoration activity outweigh the potential minor adverse impacts. For example, these projects result in benefits to riparian, stream and river channel habitats, and shoreline habitats such as wetlands. "Restoration of natural hydrology would aid in the development of vegetated communities that provide vital rearing, feeding, and refuge habitat for fish and benthic communities and wildlife species...Long-term major beneficial effects to the quality of surface water resources at the project site and beyond are expected due to restoration of…water movement. Restoration of these areas to natural states would enhance water quality,…reduce turbidity and soil erosion, increase carbon sequestration and storage

capacity, and enhance habitat quality, although some increases in turbidity in the water column could result due to increased water movement. In areas where berms and levees bounded ponded areas restored to wetland, indirect long-term, minor beneficial effects would be expected by uptake and transformation of nutrients resulting from enhanced vegetative growth in the restoration area.

"Regrading a portion of a restoration area may include the following actions: moving soil or sediment and placing the material either within the restoration area or at a disposal site, contouring the area to satisfy hydrologic and/or vegetative goals, and amending the area with topsoil or other capping material. Depending on the scope and scale of regrading, sediment or soil may be moved by non-motorized methods (e.g., shovels) or by earth-moving diggers and other equipment. These actions are expected to result in moderate, short-term, localized impacts to the re-graded area and any area that receives sediment or soil as a result of the physical movement of material and corresponding disturbance of existing habitat, and minor, short-term localized impacts resulting from the noise and exhaust from construction vehicles. However, these impacts are outweighed by the major, long-term, localized and broader benefits expected as a result of regrading. For example, likely benefits include, but are not limited to, improved hydrological conditions that will support high quality habitat and re-establish connections between habitats (e.g., wetland and riparian areas), topography that will support native vegetative communities and corresponding biota, and reduction in erosion that will improve water quality."

"Cultural and historic resources and land use could experience indirect, long-term, minor adverse impacts resulting from wetland and riparian restoration. The land use in the floodplain, including any potential culturally sensitive areas, would change as the water resources in the floodplain changed. Because land use would stabilize in the floodplain over time, the impact would be minor" (NOAA 2015b p.152)."

### 6.3.2 WETLAND, RIPARIAN, AND ECOLOGICALLY-ASSOCIATED UPLANDS PRESERVATION

Conservation actions are expected to cause indirect long-term, moderate to major beneficial impacts to natural resources that utilize the conserved area, providing ecological and human use services and contributing to restoration of habitat types that previously existed and naturally occurred in these areas. "These impacts would result from new management of land and water resources and would prevent development of other degrading activities from taking place on the project site" (NOAA 2015b p.156). "Depending on the nature of the land acquisition or protection action, land use overall could be directly and moderately benefitted over the long term, as fewer adverse environmental impacts would occur at the project site. Recreational opportunities and land use practices would largely be improved as natural areas and ecosystems are preserved (e.g., through fee simple purchase of tracts of land or of water flows in rivers). Cultural and historic resources, if located on a protected parcel, would benefit from not being disturbed by development or other degrading activities that might otherwise occur." (NOAA 2015b p.157)

### 6.3.3 RECREATIONAL FISHING ENHANCEMENT PROJECTS

Improvements to existing access areas and creation of new access areas within the Sheboygan River NRDAR assessment area would provide compensation for reduced recreational fishing opportunities associated with Site-related contamination. Compared to the "No Action Alternative", the environmental impacts of potential projects are anticipated to be minor and in many cases beneficial. Sites may range from existing formal and informal access areas to local riverside parks to new access opportunities. Improvements to roads, parking lots, trails, and boat ramps may cause minor short-term impacts to the

environment as a result of construction activities but will help to reduce erosion, promote bank stabilization, reduce impacts to riparian vegetation, and improve user safety. Negative impacts would primarily be associated with increased use, which can result in minor increases in traffic, noise, and litter.

This project type has the potential to positively impact the local economy. By increasing fishing access, it is likely that recreation in the area would increase, resulting in corresponding long-term benefits to the recreation, accommodation, and food services industries. In addition, additional fishing access would provide increased opportunities for local urban populations to participate in recreation activities. Enhancing local fishing access areas would offer urban populations opportunities that may not have been previously available.

## 6.4 EVALUATION OF ALTERNATIVE C: RESTORATION WITHIN AND BEYOND THE ASSESSMENT AREA

Alternative C, "Restoration within and beyond the Assessment Area," is expected to provide relevant natural resource services through implementation of projects within a broader geographic scope (i.e., Sheboygan River Basin within Sheboygan County) than Alternative B. Under this Alternative, project types include wetland and riparian restoration; wetland, riparian, and ecologically-associated uplands preservation; and recreational fishing enhancement projects.

The projects and project types proposed under Alternative C (e.g., habitat preservation and restoration) are expected to provide long-term cumulative, future benefits to offset the losses in natural resources and resource services incurred as a result of contamination in the assessment area (See Section 6.3 for details on the expected impacts of project types). Within the broader geographic scope of Alternative C, the Trustees do not expect adverse impacts to the economy or disadvantaged populations. Instead, the Trustees will consider project characteristics such as scope, benefits, and location to generate socio-economic benefits such as water quality improvements and increased access to recreational opportunities (e.g., nature trails, fishing).

Under Alternative C, the Trustees are specifically proposing to fund the preservation of Willow Creek and Amsterdam Dunes. As noted in Section 6.3.2, preservation is expected to have net positive environmental consequences. Specifically for Willow Creek, which supports high quality habitat, is under high

development pressure, and has no conservation protection, and Amsterdam Dunes, which supports rare and unique habitats and has only minimal conservation protection, implementation of conservation measures will more comprehensively ensure the long-term quality and sustainability of the natural resources and ecological functions supported by these properties.

## 6.5 PREFERRED ALTERNATIVE

The Trustees evaluated three general restoration alternatives. Two of these, Alternatives B and C, address natural resource injuries and service reductions resulting from the release of PCBs and PAHs within the assessment area. Based on the Trustees' evaluation of the environmental consequences of Alternatives A, B, and C, the NRDA restoration factors described in 43 CFR § 11.82(d), and the need for sufficient restoration opportunities with the geographic scope of the alternative (i.e., accounting for restoration projects completed under the AOC), the Trustees selected Alternative C as their preferred alternative.

Alternative C includes two land acquisitions for purposes of conservation and preservation, along with general categories of restoration projects. The Trustees anticipate that future restoration projects may occur on the two properties or at other locations. Where applicable, the Trustees will prepare additional RP/EAs for future proposed projects. Such future RP/EAs will consider the cumulative impacts of the proposed restoration project(s) along with other proposed or selected actions for the Sheboygan River and Harbor NRDA Site. In addition, a Section 7 consultation (under the Endangered Species Act) will be completed for restoration projects that may affect threatened or endangered species and Section 106 of the National Historic Preservation Act will be followed for each restoration project that will be implemented.

The Trustees will continue to inform the public of restoration project plans and progress.

# CHAPTER 7 | MONITORING

Monitoring is critical to the success of any restoration project, as it allows success to be measured (Kerschner 1997). Thoughtful monitoring approaches and the setting of goals and criteria enable the performance assessment necessary for project success. Monitoring determines whether the restoration project met its original objectives and provides a mechanism for altering objectives as needed during the course of a project (e.g., through adaptive management). Restoration monitoring may also provide insight into ecosystem or infrastructure function which will benefit future restoration actions (Kerschner 1997, Rieger et al. 2014). The outcome of a well-designed monitoring plan is an accurate evaluation of the design and implementation of project-related restoration techniques.

Though ecological restoration projects are fairly common, monitoring to determine project effectiveness occurs for only a fraction of funded restoration projects (Kimball et al. 2015; Roni 2005). In the absence of appropriate monitoring, it is difficult to quantify and assess success or decline in habitat structure and function, as well as specific parameters such as the status of conservation species affected by a project. Monitoring efforts need not be expensive or time intensive, though ideally they should be integrated into an adaptive management framework (PNNL 2007, Williams and Brown 2012) to ensure the data gathered are used to inform and improve subsequent restoration actions (Gregory et al. 2006).

This chapter outlines a general approach and framework that will guide the monitoring of future restoration projects in the Sheboygan River and associated restoration area.

## 7.1 SHEBOYGAN RIVER NRDA MONITORING FRAMEWORK

The Trustees have outlined a monitoring framework common to all future restoration projects. In general, comprehensive evaluation of restoration is uncommon, and thus, future restoration within the Sheboygan River and associated restoration area presents an opportunity to utilize a standard monitoring framework to collect data that will inform the ongoing project success (Kondolf and Micheli 1995; Roni 2005). Ultimately, the outcomes of restoration projects, as determined through monitoring data, will assist the Trustees in determining the best ecological techniques and the most appropriate geographical locations in which to focus projects.

Monitoring plans will be guided by standard performance criteria, or measures that assess the progress of restoration sites toward project goals and may be compared across projects. In this way, the Trustees will be able to determine which project attributes are not on target, and what actions and course corrections are needed to achieve project success. Monitoring information may also be used by the Trustees as an outreach tool to illustrate to the public continued success over time (quantitatively and qualitatively). Support for future restoration-based programs may increase due to increased public outreach (Roni 2005).

Various types of monitoring exist to answer different questions (Roni 2005; Williams et al. 1997). The most appropriate type of monitoring is decided on a project-specific basis, and is influenced by the question to be answered, the expertise of the partner, and the overall need in order to reach project goals.

- **Pre-project monitoring** is designed to characterize the specific condition of the habitat prior to restoration implementation. It should be adequate enough to document habitat degradation specific to the goals and objectives of the restoration program, and will likely include photographing the restoration site. In many cases, this information is collected as part of normal project operations.
- **Implementation monitoring** helps determine if the restoration effort was implemented properly. Implementation monitoring may focus on the field techniques used, and documents if corrections are needed, for example, due to improperly designed contract specifications. Implementation monitoring may be undertaken during the course of project maintenance and management.
- **Effectiveness monitoring** focuses on whether the restoration action was effective in attaining the desired future conditions and in meeting project objectives. Effectiveness monitoring answers, for example, whether target organisms are responding to restoration as expected, or if the habitat was restored to its proper function. This type of monitoring is more complex than implementation monitoring and requires an understanding of physical and biological factors. Sometimes effectiveness monitoring can be accomplished with qualitative methods (e.g., through site descriptions) rather than more quantitative methods. This information is often some of the most useful in illustrating how a particular restoration program is working.
- **Validation monitoring** is rigorous and specialized, and verifies assumptions made in the course of effectiveness monitoring. It is usually accomplished through ecological research. Effectiveness and validation monitoring together are specifically needed to evaluate adaptive management designs.

Exhibit 7-1 is an example of a generic monitoring framework that the Trustees will utilize for each identified restoration project. The following are components of a project-specific monitoring plan: the details of the monitoring action outlined in a step-wise manner, the performance standards, the organization or person responsible for monitoring, and the associated schedule and timing of monitoring actions.

## 7.2 ADAPTIVE MANAGEMENT

The concept of adaptive management has several definitions, and is broadly considered here to be the systematic improvement of resource management through iterative learning from project outcomes (for more information, see Murray and Marmorek (2003) and Williams and Brown (2012)). Adaptive management is a tool that synthesizes monitoring data and analyzes it against performance standards in

order to maximize the benefits of the current project, as well as increase the design effectiveness of future watershed and habitat restoration efforts (O'Donnell and Galat 2008, Williams 2011).

For example, a riparian wetland along a stream corridor may be restored for a specific bird species, but without effective monitoring data it will not be possible to determine if the targeted bird species is using the newly restored habitat, or if the habitat is sufficiently restored. Using monitoring data about the actual use of the habitat, the project may be adapted to try a different approach that increases use of the riparian habitat by the bird species.

**EXHIBIT 7-1 GENERAL MONITORING FRAMEWORK**

| MONITORING COMPONENTS | MONITORING STEP | | | |
|---|---|---|---|---|
| | PRE-PROJECT MONITORING | IMPLEMENTATION MONITORING | SHORT-TERM EFFECTIVENESS MONITORING | VALIDATION MONITORING |
| **OBJECTIVE:** What is the objective of the monitoring step? | Document pre-construction conditions. | Document if the project implementation occurred according to design plans. | Document if the main ecological or human-use outcome was achieved. | Document if the main ecological or human use outcome persists into the future. |
| **MONITORING PLAN:** Describe the monitoring plan. | For each monitoring step, describe the approach, methods, and amount of data that will be collected and assessed. This will be specific to each selected project. | | | |
| **PERFORMANCE STANDARDS:** What are the performance standards? | For each monitoring step, include a specific performance criterion to evaluate progress as monitoring progresses. | | | |
| **ORGANIZATIONS:** Who is responsible for the monitoring step? | For each monitoring step, record the person or organization that is responsible for conducting the monitoring as well as any related assessment or analysis of monitoring data. | | | |
| **SCHEDULE:** How does monitoring fit into the project schedule? | For each monitoring step, outline a schedule for completion of monitoring tasks. In general, pre-project monitoring will occur before restoration begins; implementation monitoring will occur immediately following the completion of restoration actions; and short-term effectiveness and validation monitoring will use time frames specific to each selected project. | | | |

The Trustees have both restoration planning experience and an available body of literature to enable efficient restoration project planning (e.g., Haney and Power 1996; Palmer et al. 2005; Rieger at al. 2014), which will be helpful in developing an adaptive management framework that includes common performance standards for future restoration projects. The success of adaptive management is contingent upon identifying performance standards at the beginning of a project, thus enabling specific targets to be evaluated (Kondolf and Micheli 1995; O'Donnell and Galat 2008). Moving forward with restoration projects, the Trustees will ensure long-term success by implementing standard procedures to assess whether intermediate milestones are met or whether the technical parameters need to be altered to ensure

project success.  The Trustees plan to efficiently allocate monitoring funds on a project-specific basis to ensure that a relevant and cost-effective type of monitoring is chosen for each project.

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# APPENDIX A WILLOW CREEK PROPERTY INFORMATION

# WILLOW CREEK: LEGAL DESCRIPTION OF PROPERTY FOR PRESERVATION

## LOT 2

Lot 2 Certified Survey Map recorded in Volume 27 on Pages 215-219 as Document no. 2024388, being a of division of a part of Lot 2, Certified Survey Map recorded in Volume 16, Pages 286 and 287 and lands in part of the NE 1/4, SE 1/4 and SW 1/4 of the SW 1/4, and the SW 1/4 of the SE 1/4 of Section 21, and parts of Gov't Lots 3 and 4 located in the NE 1/4, SE 1/4, SW 1/4 and NW 1/4 of the NW 1/4, and parts of Gov't Lots 1 and 2 located in the NE 1/4, SW 1/4 and NW 1/4 of the NE 1/4 of Section 28, Township 15 North, Range 23 East, in the City of Sheboygan, Sheboygan County, Wisconsin.

## LOT 3

Lot 3 Certified Survey Map recorded in Volume 27 on Pages 215-219 as Document no. 2024388, being a of division of a part of Lot 2, Certified Survey Map recorded in Volume 16, Pages 286 and 287 and lands in part of the NE 1/4, SE 1/4 and SW 1/4 of the SW 1/4, and the SW 1/4 of the SE 1/4 of Section 21, and parts of Gov't Lots 3 and 4 located in the NE 1/4, SE 1/4, SW 1/4 and NW 1/4 of the NW 1/4, and parts of Gov't Lots 1 and 2 located in the NE 1/4, SW 1/4 and NW 1/4 of the NE 1/4 of Section 28, Township 15 North, Range 23 East, in the City of Sheboygan, Sheboygan County, Wisconsin.

8 3 9 4 2 9 1
Tx:4116762

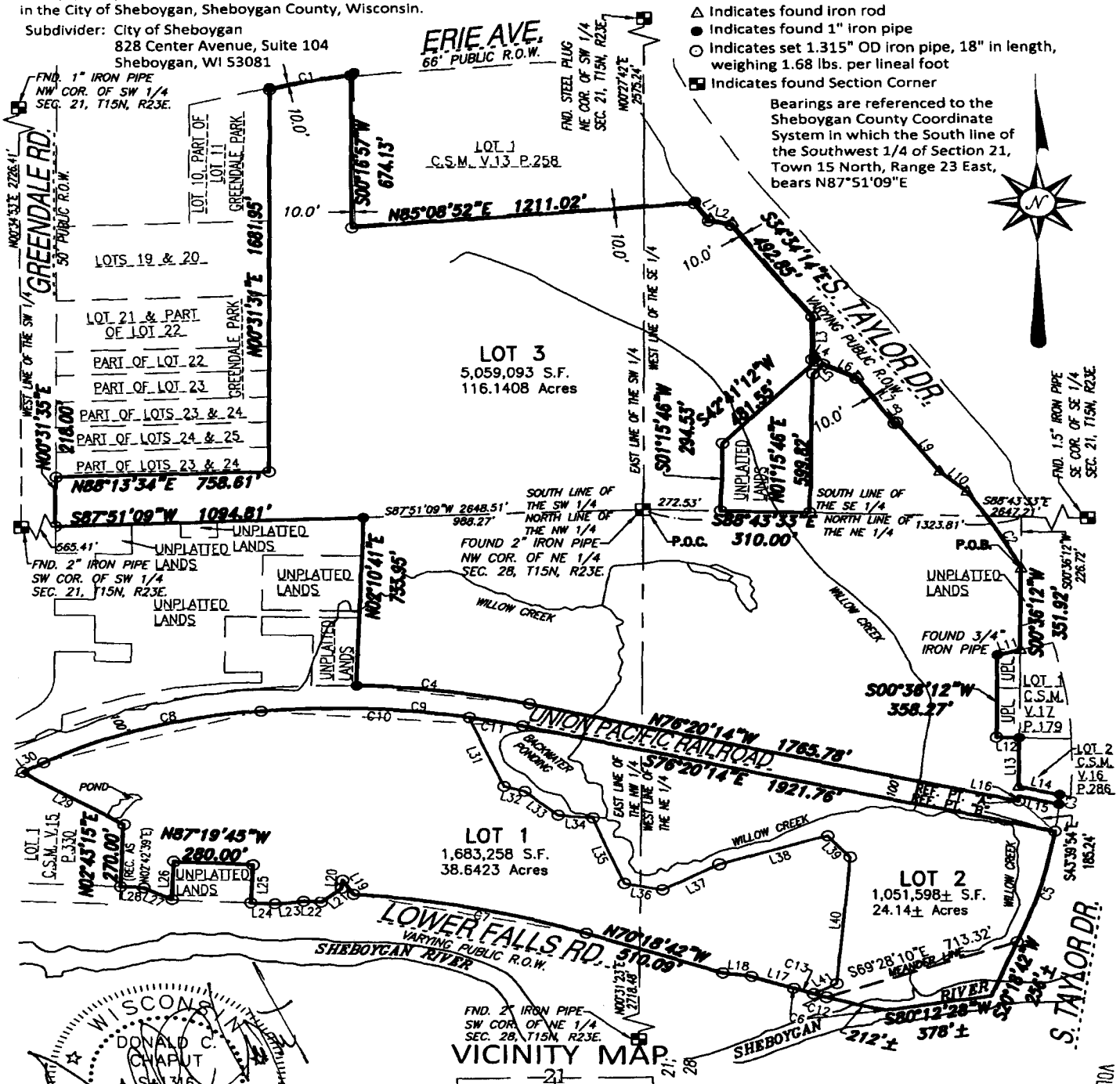
# CERTIFIED SURVEY MAP NO._____

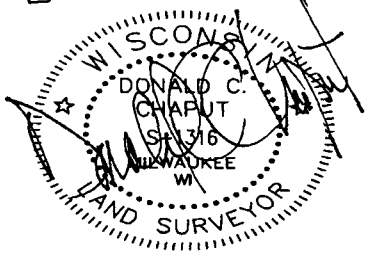
A division of a part of Lot 2, Certified Survey Map recorded in Volume 16, Pages 286 and 287 and lands in part of the NE 1/4, SE 1/4 and SW 1/4 of the SW 1/4, and the SW 1/4 of the SE 1/4 of Section 21, and parts of Gov't Lots 3 and 4 located in the NE 1/4, SE 1/4, SW 1/4 and NW 1/4 of the NW 1/4, and parts of Gov't Lots 1 and 2 located in the NE 1/4, SW 1/4 and NW 1/4 of the NE 1/4 of Section 28, Township 15 North, Range 23 East, in the City of Sheboygan, Sheboygan County, Wisconsin.

Subdivider: City of Sheboygan
828 Center Avenue, Suite 104
Sheboygan, WI 53081

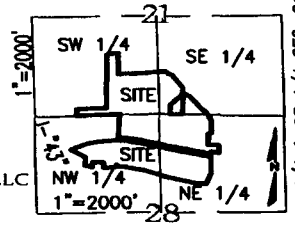
△ Indicates found iron rod
● Indicates found 1" iron pipe
○ Indicates set 1.315" OD iron pipe, 18" in length, weighing 1.68 lbs. per lineal foot
■ Indicates found Section Corner

Bearings are referenced to the Sheboygan County Coordinate System in which the South line of the Southwest 1/4 of Section 21, Town 15 North, Range 23 East, bears N87°51'09"E




## VICINITY MAP





CHAPUT LAND SURVEYS LLC
234 W. FLORIDA STREET
MILWAUKEE, WI 53204
414-224-8068
www.chaputlandsurveys.com


This instrument was drafted by Donald C. Chaput
Professional Land Surveyor S-1316

SHEET 1 OF 5
Date: May 17, 2016
Drawing No. 2242-dmb

VOL 27 PAGE 215

# CERTIFIED SURVEY MAP NO._____

A division of a part of Lot 2, Certified Survey Map recorded in Volume 16, Pages 286 and 287 and lands in part of the NE 1/4, SE 1/4 and SW 1/4 of the SW 1/4, and the SW 1/4 of the SE 1/4 of Section 21, and parts of Gov't Lots 3 and 4 located in the NE 1/4, SE 1/4, SW 1/4 and NW 1/4 of the NW 1/4, and parts of Gov't Lots 1 and 2 located in the NE 1/4, SW 1/4 and NW 1/4 of the NE 1/4 of Section 28, Township 15 North, Range 23 East, in the City of Sheboygan, Sheboygan County, Wisconsin.

Subdivider: City of Sheboygan
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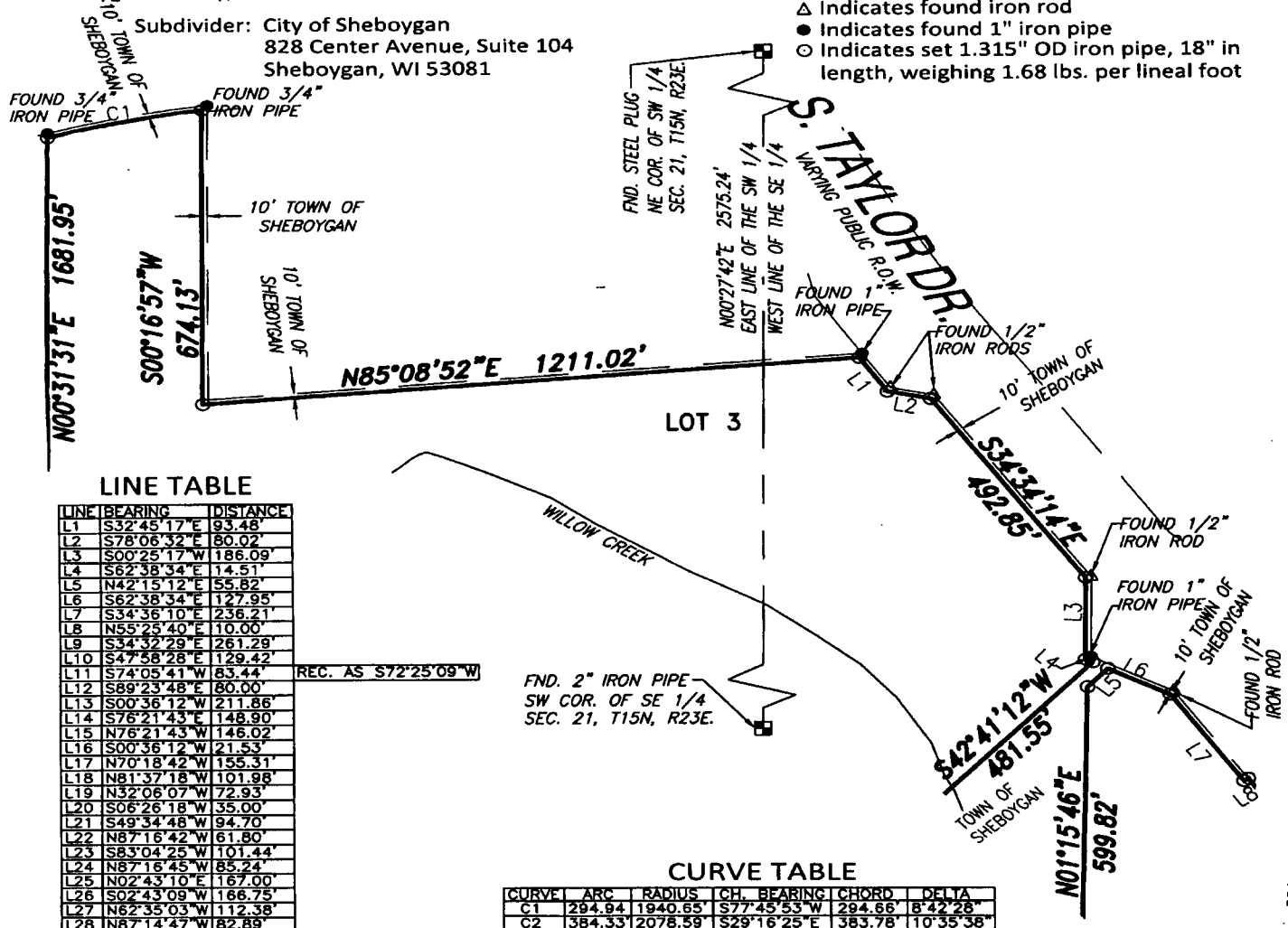
Sheboygan, WI 53081

△ Indicates found iron rod
● Indicates found 1" iron pipe
⊙ Indicates set 1.315" OD iron pipe, 18" in length, weighing 1.68 lbs. per lineal foot




## LINE TABLE

| LINE | BEARING | DISTANCE | |
|---|---|---|---|
| L1 | S32°45'17"E | 93.48' | |
| L2 | S78°06'32"E | 80.02' | |
| L3 | S00°25'17"W | 186.09' | |
| L4 | S62°38'34"E | 14.51' | |
| L5 | N42°15'12"E | 55.82' | |
| L6 | S62°38'34"E | 127.95' | |
| L7 | S34°36'10"E | 236.21' | |
| L8 | N55°25'40"E | 10.00' | |
| L9 | S34°32'29"E | 261.29' | |
| L10 | S47°58'28"E | 129.42' | |
| L11 | S74°05'41"W | 83.44' | REC. AS S72°25'09"W |
| L12 | S89°23'48"E | 80.00' | |
| L13 | S00°36'12"W | 211.86' | |
| L14 | S76°21'43"E | 148.90' | |
| L15 | N76°21'43"W | 146.02' | |
| L16 | S00°36'12"W | 21.53' | |
| L17 | N70°18'42"W | 155.31' | |
| L18 | N81°37'18"W | 101.98' | |
| L19 | N32°06'07"W | 72.93' | |
| L20 | S06°26'18"W | 35.00' | |
| L21 | S49°34'48"W | 94.70' | |
| L22 | N87°16'42"W | 61.80' | |
| L23 | S83°04'25"W | 101.44' | |
| L24 | N87°16'45"W | 85.24' | |
| L25 | N02°43'10"E | 167.00' | |
| L26 | S02°43'09"W | 166.75' | |
| L27 | N62°35'03"W | 112.38' | |
| L28 | N87°14'47"W | 82.89' | |
| L29 | N57°16'46"W | 430.73' | REC. AS N57°17'22"W |
| L30 | N60°28'58"E | 87.49' | |
| L31 | S22°01'50"E | 327.95' | |
| L32 | S73°16'38"E | 75.96' | |
| L33 | S47°57'44"E | 158.04' | |
| L34 | S84°45'14"E | 122.56' | |
| L35 | S21°27'01"E | 306.38' | |
| L36 | S78°12'15"E | 136.48' | |
| L37 | N60°31'33"E | 230.12' | |
| L38 | N71°38'48"E | 398.30' | |
| L39 | S40°31'14"E | 122.26' | |
| L40 | S04°55'06"W | 558.15' | |
| L41 | S60°10'53"W | 92.48' | |

## CURVE TABLE

| CURVE | ARC | RADIUS | CH. BEARING | CHORD | DELTA |
|---|---|---|---|---|---|
| C1 | 294.94' | 1940.65' | S77°45'53"W | 294.66' | 8°42'28" |
| C2 | 384.33' | 2078.59' | S29°16'25"E | 383.78' | 10°35'38" |
| C3 | 42.14' | 2038.59' | S04°25'45"W | 42.14' | 1°11'04" |
| C4 | 616.37' | 2830.12' | N82°40'15"W | 615.15' | 12°28'42" |
| C5 | 503.67' | 2030.32' | S15°31'03"W | 502.38' | 14°12'49" |
| C6 | 194.69' | 2684.57' | N72°12'13"W | 194.65' | 4°09'19" |
| C7 | 841.61' | 3021.17' | N78°28'21"W | 838.89' | 15°57'39" |
| C8 | 811.54' | 1925.79' | N73°23'20"E | 805.55' | 24°08'41" |
| C9 | 931.79' | 2797.18' | S86°08'28"E | 927.49' | 19°05'10" |
| C10 | 738.17' | 2797.18' | S88°07'27"E | 736.03' | 15°07'13" |
| C11 | 193.62' | 2797.18' | S78°34'52"E | 193.58' | 3°57'58" |
| C12 | 46.37' | 2684.57' | N72°13'07"W | 46.37' | 0°59'23" |
| C13 | 74.86' | 2684.57' | N70°55'30"W | 74.86' | 1°35'52" |

WISCONSIN
DONALD C. CHAPUT
S-1316
MILWAUKEE WI
LAND SURVEYOR

GRAPHIC SCALE
0 300 600
( IN FEET )
1 inch = 300 ft.

VOL 27 PAGE 216


CHAPUT LAND SURVEYS LLC
234 W. FLORIDA STREET
MILWAUKEE, WI 53204
414-224-8068
www.chaputlandsurveys.com


This instrument was drafted by Donald C. Chaput
Professional Land Surveyor S-1316

SHEET 2 OF 5
Date: May 17, 2016
Drawing No. 2242-dmb

# CERTIFIED SURVEY MAP NO._____

A division of a part of Lot 2, Certified Survey Map recorded in Volume 16, Pages 286 and 287 and lands in part of the NE 1/4, SE 1/4 and SW 1/4 of the SW 1/4, and the SW 1/4 of the SE 1/4 of Section 21, and parts of Gov't Lots 3 and 4 located in the NE 1/4, SE 1/4, SW 1/4 and NW 1/4 of the NW 1/4, and parts of Gov't Lots 1 and 2 located in the NE 1/4, SW 1/4 and NW 1/4 of the NE 1/4 of Section 28, Township 15 North, Range 23 East, in the City of Sheboygan, Sheboygan County, Wisconsin.

## SURVEYOR'S CERTIFICATE

STATE OF WISCONSIN}
:SS
MILWAUKEE COUNTY}

I, DONALD C. CHAPUT, Professional Land Surveyor, do hereby certify:

THAT I have surveyed, divided and mapped a division of a part of Lot 2, Certified Survey Map recorded in Volume 16, Pages 286 and 287 and lands in part of the NE 1/4, SE 1/4 and SW 1/4 of the SW 1/4, and the SW 1/4 of the SE 1/4 of Section 21, and parts of Gov't Lots 3 and 4 located in the NE 1/4, SE 1/4, SW 1/4 and NW 1/4 of the NW 1/4, and parts of Gov't Lots 1 and 2 located in the NE 1/4, SW 1/4 and NW 1/4 of the NE 1/4 of Section 28, Township 15 North, Range 23 East, in the City of Sheboygan, Sheboygan County, Wisconsin, bound and described as follows;

Commencing at the NW corner of the NE 1/4 of said Section 28; thence South 88°43'33" East along the North line of said 1/4 Section 1323.81 feet to a point; thence South 00°36'12" West 226.72 feet to the point of beginning of lands described hereinafter; thence South 00°36'12" West 351.92 feet to a point, said point being the Northwest corner of Lot 1 of Certified Survey Map recorded in Volume 17, Page 179; thence South 74°05'41" West 83.44 feet to a point; thence South 00°36'12" West 358.27 feet to a point; thence South 89°23'48" East 80.00 feet to a point, said point being the Northwest corner of Lot 2 of Certified Survey Map recorded in Volume 16, Page 286; thence South 00°36'12" West 211.86 feet along the West line of said Lot 2 a distance of 211.86 feet to the Southwest corner of said Lot 2; thence South 76°21'43 East along the South line of said Lot 2 a distance of 148.90 feet to the West line of South Taylor drive; thence Southerly along said West line 42.14 feet on the arc of a curve, whose radius is 2038.59, whose center lies to the West and whose chord bears South 04°25'45" West 42.14 feet; thence North 76°21'43" West 146.02 feet to a point; thence South 00°36'12" West 21.53 feet to Reference Point "A"; thence South 43°39'54" East 185.24 feet to a point on the West line of South Taylor Drive and Reference Point "B"; thence Southwesterly along said West line 503.67 feet on the arc of a curve, whose radius is 2,030.32 feet, whose center lies to the West and whose chord bears South 15°31'03" West 502.38 feet to a meander corner, said corner is 256 feet more or less Northeasterly from the centerline of the Sheboygan River; thence South 69°28'10" West along a meander line 713.32 feet to a point in the North line of Lower Falls Road, said point being 212 feet more or less Northwesterly from the centerline of the Sheboygan River; thence Northwesterly 121.23 feet along said North line on the arc of a curve, whose radius is 2,684.57 feet, whose center lies to the North and whose chord bears North 71°25'11" West 121.22 feet to a point; thence North 70°18'42" West along said North line 155.31 feet to a point; thence North 81°37'18" West along said North line 101.98 feet to a point; thence North 70°18'42" West along said North line 510.09 feet to a point; thence Northwesterly 841.61 feet along said North line on the arc of a curve, whose radius is 3021.17 feet, whose center lies to the South and whose chord bears North 78°28'21" West 838.89 feet to a point; thence North 32°06'07" West along said North line 72.93 feet to a point; thence South 06°26'18" West along said North line 35.00 feet to a point; thence South 49°34'48" West along said North line 94.70 feet to a point; thence North 87°16'42" West along said North line 61.80 feet to a point; thence South 83°04'25" West along said North line 101.44 feet to a point; thence North 87°16'45" West along said North line 85.24 feet to a point; thence North 02°43'10" East 167.00 feet to a point; thence North 87°19'45" West 280.00 feet to a point; thence South 02°43'09" West 166.75 feet to a point on the North line of Lower Falls Road; thence North 62°35'03" West along said North line 112.38 feet to a point; thence North 87°14'47" West along said North line 82.89 feet to the Southwest corner of Lot 1 of a Certified Survey Map recorded in Volume 15, Page 330; thence North 02°43'15" East along the East line of said Lot 1 aforesaid 270.00 feet to the North line of said Lot 1; thence North 57°16'46" West along said North line 430.73 feet to a point on the South line of the Union Pacific Railroad lands; thence North 60°28'58" East along said South line 87.49 feet to a point; (Continued on next sheet)

VOL 27 PAGE 217

May 17, 2016
DATE

DONALD C. CHAPUT
PROFESSIONAL LAND SURVEYOR S-1316

WISCONSIN
DONALD C. CHAPUT
S-1316
MILWAUKEE
WI
LAND SURVEYOR

CHAPUT LAND SURVEYS LLC
234 W. FLORIDA STREET
MILWAUKEE, WI 53204
414-224-8068
www.chaputlandsurveys.com

This instrument was drafted by Donald C. Chaput Professional Land Surveyor S-1316


Drawing No. 2242-dmb

# CERTIFIED SURVEY MAP NO._____

A division of a part of Lot 2, Certified Survey Map recorded in Volume 16, Pages 286 and 287 and lands in part of the NE 1/4, SE 1/4 and SW 1/4 of the SW 1/4, and the SW 1/4 of the SE 1/4 of Section 21, and parts of Gov't Lots 3 and 4 located in the NE 1/4, SE 1/4, SW 1/4 and NW 1/4 of the NW 1/4, and parts of Gov't Lots 1 and 2 located in the NE 1/4, SW 1/4 and NW 1/4 of the NE 1/4 of Section 28, Township 15 North, Range 23 East, in the City of Sheboygan, Sheboygan County, Wisconsin.

## SURVEYOR'S CERTIFICATE

STATE OF WISCONSIN}
:SS
MILWAUKEE COUNTY}

(Continued)....thence Northeasterly 811.54 feet along said South line on the arc of a curve, whose radius is 1925.79 feet, whose center lies to the South and whose chord bears North 73°23'20" East 805.55 feet to a point; thence Easterly 931.79 feet along said South line on the arc of a curve, whose radius is 2797.18 feet, whose center lies to the South and whose chord bears South 86°08'28" East 927.49 feet to a point; thence South 76°20'14" East 1921.76 feet to Reference Point "B"; thence North 43°39'54" West 185.24 feet to Reference Point "A"; thence North 76°20'14" West along the North line of the Union Pacific Railroad lands 1765.78 feet to a point; thence Northeasterly 616.37 feet along said North line on the arc of a curve, whose radius is 2830.12 feet, whose center lies to the South and whose chord bears North 82°40'15" West 615.15 feet to a point; thence North 02°10'41" East 733.95 feet to a point on the North line of said NW 1/4 of Section 28, said point being South 87°51'09" West 988.27 feet from the NE corner of the NW 1/4 of said Section; thence South 87°51'09" West along said North line 1094.81 feet to a point on the East line of Greendale Road, said point being North 87°51'09" East 565.41 feet from the SW corner of the SW 1/4 of Section 21; thence North 00°31'35" East along said East line 218.00 feet to a point on the South line of Greendale Park, a recorded subdivision; thence North 88°13'34" East along said South line 758.61 feet to a point on the East line of said Greendale Park; thence North 00°31'31" East along said East line 1681.95 feet to a point 10 feet south of the South line of Erie Avenue; thence Easterly 294.94 feet along the arc of a curve 10 feet south of and parallel to said South line, whose radius is 1940.65, whose center lies to the South and whose chord bears North 77°45'53 West 294.66 feet to a point 10 feet West of the West line of a Lot 2, Certified Survey Map recorded in Volume 13 of Page 258; thence South 00°16'57" West 674.13 feet on a line 10 feet west of and parallel to the West line of said Lot 2, to a point; thence North 85°08'52" East 1211.02 feet on a line 10 feet South of and Parallel to the South line of said Lot 2, to a point 10 feet West of the Southwesterly right of way for South Taylor Drive; thence South 32°45'17 East parallel to said Southwesterly line 93.48 feet to a point; thence South 78°06'32" East parallel to said Southwesterly line 80.02 feet to a point; thence South 34°34'14" East parallel to said Southwesterly line 492.85 feet to a point; thence South 00°25'17" West parallel to said Southwesterly line 186.09 feet to a point; thence South 62°38'34" East parallel to said Southwesterly line 14.51 feet to a point; thence South 42°41'12" West 481.55 feet to a point; thence South 01°15'46" West 294.53 feet to a point on the South line of the SE 1/4 of Section 21, said point being South 88°43'33" East 272.53 feet from the SW corner of the SE 1/4 of Section 21; thence South 88°43'33" East along said South line 310.00 feet to a point; thence North 01°15'46" East 599.82 feet to a point; thence North 42°15'12" East 55.82 feet to a point 10 West of the Southwesterly right of way for South Taylor Drive; thence South 62°38'34" East 127.95 feet parallel to said Southwesterly line; thence South 34°36'10" East 236.21 on a line 10 feet and parallel to said Southwesterly line to a point; thence North 55°25'40" East 10.00 feet to the Southwesterly right of way of South Taylor Drive; thence South 34°32'29" East along said Southwesterly line 261.29 feet to a point; thence South 47°58'28" East along said Southwesterly line 129.42 feet to a point; thence along said Southwesterly line and the arc of a curve a distance of 384.33 feet, whose radius is 2078.59 feet, whose center lies to the Southwest and whose chord bears South 29°16'25" East 383.78 feet to the point of beginning.

Said lands contain 7,756,950 square feet, more or less, or 178.08 acres, more or less.

THAT I have made the survey, land division and map by the direction of City of Sheboygan, owner.

THAT the map is a correct representation of all the exterior boundaries of the land surveyed and the land division thereof made.

THAT I have fully complied with the provisions of Chapter 236 of the Wisconsin Statutes and the Land Division and Ordinances of the City of Sheboygan in surveying, dividing and mapping the same.

May 17, 2016
DATE

DONALD C. CHAPUT
PROFESSIONAL LAND SURVEYOR S-1316

WISCONSIN DONALD C. CHAPUT S-1316 MILWAUKEE WI LAND SURVEYOR

CHAPUT LAND SURVEYS LLC
234 W. FLORIDA STREET
MILWAUKEE, WI 53204
414-224-8068
www.chaputlandsurveys.com

This instrument was drafted by Donald C. Chaput Professional Land Surveyor S-1316

SHEET 4 OF 5
Drawing No. 2242-dmb

VOL 27 PAGE 218

# CERTIFIED SURVEY MAP NO._____

A division of a part of Lot 2, Certified Survey Map recorded in Volume 16, Pages 286 and 287 and lands in part of the NE 1/4, SE 1/4 and SW 1/4 of the SW 1/4, and the SW 1/4 of the SE 1/4 of Section 21, and parts of Gov't Lots 3 and 4 located in the NE 1/4, SE 1/4, SW 1/4 and NW 1/4 of the NW 1/4, and parts of Gov't Lots 1 and 2 located in the NE 1/4, SW 1/4 and NW 1/4 of the NE 1/4 of Section 28, Township 15 North, Range 23 East, in the City of Sheboygan, Sheboygan County, Wisconsin.

## OWNER'S CERTIFICATE

THE CITY OF SHEBOYGAN, a Wisconsin municipality, duly organized and existing under and by virtue of the laws of the State of Wisconsin, as owner, hereby certifies that said municipality caused the land described on this Certified Survey Map to be surveyed, divided and mapped as represented on this map in accordance with the requirements of the City of Sheboygan.

THE CITY OF SHEBOYGAN, as owner, does further certify that this map is required by S.236.20 or 236.12 to be submitted to the following for approval or objection: City of Sheboygan.

IN WITNESS WHEREOF, THE CITY OF SHEBOYGAN, has caused these presents to be signed by the hand of Michael Vandersteen, MAYOR, on this 25th day of July, 2016

In the presence of:

Mike Vandersteen, MAYOR

CHAD D. PELISHEK NOTARY PUBLIC STATE OF WISCONSIN

STATE OF WISCONSIN}
:SS
SHEBOYGAN COUNTY}

Personally came before me this 25 day of July, 2016, Michael Vandersteen of THE CITY OF SHEBOYGAN, a Wisconsin municipality, to me known as the person who executed the foregoing instrument and acknowledged that he executed the foregoing instrument as such officer as the deed of said limited liability company, by its authority.

Notary Public
State of Wisconsin
My commission expires. Aug 31, 2019
My commission is permanent.

## PLANNING COMMISSION CERTIFICATE OF APPROVAL

APPROVED by the Planning Commission of the City of Sheboygan on this 25 day of July, 2016.

Mike Vandersteen, Mayor

Steve Sokolowski, Secretary

WISCONSIN DONALD C. CHAPUT S-1316 MILWAUKEE WI LAND SURVEYOR

**2024388**
**SHEBOYGAN COUNTY, WI**
**RECORDED ON**
**07/26/2016 9:08 AM**
**ELLEN R. SCHLEICHER**
**REGISTER OF DEEDS**
**RECORDING FEE: 30.00**
**EXEMPTION #**
**Cashier ID: 2**
**PAGES: 5**

VOL 27 PAGE 219

CHAPUT LAND SURVEYS LLC
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This instrument was drafted by Donald C. Chaput
Professional Land Surveyor S-1316

SHEET 5 of 5
Date: May 17, 2016
Drawing No. 2242-dmb

# APPENDIX B AMSTERDAM DUNES CONSERVATION EASEMENT

8 3 4 4 1 5 3
Tx:4096719

**2005859**
**SHEBOYGAN COUNTY, WI**
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**07/09/2015 4:17 PM**
**ELLEN R. SCHLEICHER**
**REGISTER OF DEEDS**
**RECORDING FEE: 30.00**
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Document Number

# GRANT OF CONSERVATION EASEMENT

Recording Area

Name and Return Address:
**Attorney Daniel Geraghty**
**Whyte Hirschboeck Dudek, SC**
**555 East Wells**
**Milwaukee, WI 53202**

**THIS GRANT OF CONSERVATION EASEMENT** is made this 9th day of July, 2015, by and between **SHEBOYGAN COUNTY, WISCONSIN**, a Wisconsin governmental body corporate with its principal place of business at 508 New York Avenue, Sheboygan, WI 53081-4126 ("Landowner") and **GLACIAL LAKES CONSERVANCY, INC.**, a Wisconsin non-stock not-for-profit corporation with an address of 529 Ontario Avenue, Sheboygan, WI 53081 ("Easement Holder" or "Holder").

## PURPOSES

The purpose of this Grant of Conservation Easement ("Grant" or "Conservation Easement") is to forever conserve the Property for the following conservation purposes:

1. to protect in perpetuity the Property's significant open space, natural wildlife habitat, natural scenic and ecological conservation values for public benefit;
2. to maintain land cover and land use that are known to be effective in reducing the likelihood of adverse impacts to the water quality and quantity of subsurface and surface waters and wetlands values of the Property and to protect the fertility and quality of its soils;
3. to assure the sustained and natural capacity of the Property and its soils to support healthy and vigorous forests, wetlands, prairies, maintain a healthy and biologically-diverse landscape that supports a full range of native flora and fauna and limits adverse aesthetic and ecological impacts;
4. to ensure that the scenic and associated open space features of the property will be retained and maintained consistent with the Conservation Value of the Property and to permit the public to enjoy the scenic values of the Property;
5. to prevent any use or change of the Property that will significantly impair or interfere with the Property's Conservation Values.

The protected Conservation Values of the Property and the purpose hereof are more particularly described in the following Recitals, incorporated herein:

## WITNESSETH:

**WHEREAS**, Landowner holds title in fee simple to certain real estate ("Property") in Sheboygan County, Wisconsin, legally described on **Exhibit A** attached hereto and depicted on the map attached as **Exhibit B** as the stewardship property, and

**WHEREAS**, the Property has and contains Conservation Values as described herein, and

**WHEREAS**, the Property is situated in three non-contiguous areas along Lake Michigan and comprises a total of approximately one hundred eighty-four (184) acres, more or less; including dry mesic, lowland, and mesic forest, to be restored dry and mesic prairies, forests, wetlands and shore land, all of which provide scenic vistas and all of which provide relatively natural habitat for plants and wildlife and are elements of the Conservation Values of the Property, and

**WHEREAS**, the Property is prominently visible from and provides scenic enjoyment to the general public from Sauk Trail Road, Amsterdam Road, and those areas of public beach, all of which are adjacent to the Property, and

**WHEREAS** further scenic enjoyment may be viewed from low-impact trails and/or observation platforms to be potentially implemented in the future, and

**WHEREAS**, the wooded areas, prairies, and wetlands on the Property are elements of the Conservation Values of the Property, and

**WHEREAS**, the Conservation Values of the Property include significant natural scenic and open space areas, relatively natural wildlife and plant habitat, glacial geology, and high quality wetlands to protect, preserve, and restore, and

**WHEREAS**, Landowner desires and intends to convey to Holder this Conservation Easement to achieve the purposes set forth herein, and Holder desires and intends to accept the Grant of Conservation Easement consistent with an Agreement for Transfer by Amsterdam Dunes, entered into by the parties on September 11, 2014, and

**WHEREAS**, Landowner desires and intends to protect and preserve the Property and the Conservation Values thereof, including the Property's open space, natural, scenic, and ecological values by prohibiting any development or use of the Property (other than as provided herein) that would diminish the Conservation Values thereof, and

**WHEREAS** Holder is a publicly-supported, tax-exempt organization described in Sections 501(c)(3) and 509(a)(1) of the Internal Revenue Code, among whose purposes are the preservation, protection, and enhancement of working, urban, and natural lands that contribute significantly to the ecological integrity, agricultural sustainability, scenic beauty, and recreational enjoyment of Fond du Lac, Manitowoc, Kewaunee, Calumet, and Sheboygan Counties in Wisconsin, and

**WHEREAS**, Holder is a qualified organization as described in Section 170(h) of the Internal Revenue Code, is qualified to hold conservation easements under Wis. Stat. § 700.40, and is a non-profit conservation organization as described in Wis. Stat. ch. 23 and the regulations promulgated thereunder and is eligible to receive grants thereunder, and

**WHEREAS**, the parties recognize that this Conservation Easement will provide a significant benefit to the people of Sheboygan County and the State of Wisconsin, and

**WHEREAS**, the common law and Wis. Stat. § 700.40 recognize conservation easements for the purposes of protecting the natural, scenic, and open space values of real property, protecting natural resources and maintaining or enhancing air and water quality, and

**WHEREAS**, the Conservation Values and the current, physical, and overall biological conditions of the Property, as well as its current uses and state of improvement, are described in a "Baseline Documentation Report" prepared by Holder with the cooperation of the Landowner, consisting of maps, photographs, and other documents, that the parties acknowledge is an accurate representation of the Property at the time of this Grant, allowing Holder to monitor compliance with the terms of this Easement. This report, however, is not intended to preclude the use of other evidence to establish the baseline condition of the Easement Area if there is a controversy over some aspect of that condition; and

**WHEREAS**, The parties acknowledge that the Property was purchased in part with State of Wisconsin Knowles-Nelson Stewardship funds and is therefore subject to a Stewardship Grant and Management Contract (Grant Number HA3-15-226) with the Wisconsin Department of Natural Resources (the "Stewardship Contract") and Landowner has agreed to an assignment of the Stewardship Contract and shall be bound thereto; and

**WHEREAS**, Landowner and Holder recognize the Conservation Values of the property, including the natural, open space, and scenic values of the Property described in the preceding recitals and share the common purpose of protecting these Values as reflected in this Grant to prevent the use or development of the Property for any purpose or in any manner that would conflict with the provisions of this Grant.

**NOW, THEREFORE**, in consideration of the recitals hereinabove set forth, the mutual covenants, terms, conditions, and restrictions contained herein, and as an absolute and unconditional gift and pursuant to Wis. Stat. § 700.40, Landowner hereby voluntarily grants and conveys unto Easement Holder and its successors and assigns a Conservation Easement in perpetuity over the Property of the nature and character and to the extent hereinafter set forth:

1. **Rights Conveyed to Easement Holder**. To accomplish the purposes of this Easement, the following rights are conveyed to Easement Holder:

a. to own and to hold all interests, including property interests, conveyed by this Easement in perpetuity;

b. to take such actions as are necessary to preserve and protect all of the Conservation Values of the Property in perpetuity;

c. to enforce the terms of this Easement and otherwise prevent any activity on or use of the Property inconsistent with the protection of the Conservation Values of the Property or with the terms hereof and to require restoration of the Property as may be required on account of damage, inconsistent activity or violation hereof, by exercising the enforcement remedies provided below;

d. to enter upon the Property at all reasonable times and upon reasonable prior notice to Landowner to identify the current condition of, uses, and practices thereon, and to monitor compliance with the terms hereof, provided that prior notice shall not be required in the event that Holder determines that immediate entry is required to prevent, terminate, or mitigate a violation of this Easement or in the event of an emergency;

e. to post signs with Landowner's approval to provide public notice of this Easement and of Holder's rights hereunder.

2. **Prohibited Uses and Activities**. In furtherance of the foregoing, Landowner makes the following covenants on Landowner's behalf and Landowner's heirs and assigns, which covenants shall run with and bind the Property in perpetuity. Without written consent from Easement Holder, which may be granted only as provided herein, any activity on or use of the Property inconsistent with the purpose of this Grant is prohibited. Without limiting the generality of the foregoing, the following specific uses and activities shall be and are expressly prohibited:

a. Division of Property Prohibited. The parties recognize that the fractionalization of ownership interest in the Property increases the burden on the Easement Holder to monitor and enforce this Grant and intend by this subparagraph to require that the Property remain in unified ownership, either joint or undivided, except to the extent permitted in this subparagraph. The Property shall not be subdivided, divided, or conveyed in separate parcels, whether through legal or *de facto* subdivision or by any other means, including divisions through the creation of condominiums, site adjustments, or other means except as permitted below. Further, ownership of any present or future buildings, structures, or improvements on the Property shall not be separated from the ownership of the Property by any means, direct or indirect, except as permitted below. Except as provided herein, it is the intent of this subparagraph to prohibit the conveyance of any existing tax parcels or whole legal descriptions, except as a part of the entire Property. Boundary line adjustments that in total do not exceed one-tenth of an acre (.1) for the entire Property are permitted only to correct technical errors made in the survey or legal description.

b. Buildings, Structures, and Improvements Limited. There shall be no commercial or residential development of the Property. Buildings, structures, or improvements may be constructed, maintained, renovated, expanded, or replaced only to support conservation or wetland-based recreation or educational purposes. If the Landowner desires to erect any such structures, it shall provide notice to the Holder describing the structure's dimension and proposed use at least thirty (30) days prior to construction. Within such thirty (30) day period, the Holder shall approve or disapprove of such buildings or structures. In no event will more than two (2) buildings be added, with an aggregate square footage of 4,500 square feet.

c. Commercial and Industrial Uses Prohibited. Use of the Property for commercial or industrial purposes, including use by easement or other right of access or passage across or upon the Property in conjunction with commercial activity other than underground utility easements that have previously been granted.

d. Surface Alterations Prohibited. Except for restoration activities permitted by Paragraph 2.g.iii, 3.c, or as dictated by the Natural Resources Management Plan referred to in Paragraph 4.a herein and roadways and parking as may be necessary to fulfill the Conservation Values, no additional filling, dumping, excavation, or other alteration may be made to the surface or subsurface of the Property or to its surface waters or wetlands

except to accomplish such rights reserved by the Landowner, in which case, the disturbed surrounding area must be restored as soon as reasonably possible to a state consistent with the Conservation Values. Roadways and parking shall be limited to one roadway made of gravel or other pervious material or other material acceptable to Holder and a parking lot, or parking lots, of similar material no larger than a combined 10,000 square feet.

e. Soil Degradation Prohibited. Except for restoration activities permitted by Paragraphs 2.g.iii, 3.c, or as dictated by the Natural Resources Management Plan referred to in Paragraph 4.a herein, any use or activity that causes or is likely to cause significant soil degradation, loss, erosion, or significant pollution of any surface or subsurface waters is prohibited.

f. Wetlands Degradation and Water Manipulation Prohibited. Except for restoration activities permitted by Paragraph 3.c , or as dictated by the Natural Resources Management Plan referred to in Paragraph 4.a herein, any use or activity, including the draining, tiling, ditching, filling in with earth or any other material that causes or may cause significant degradation of the wetlands or of any wetlands, streams, springs, lakes, ponds, marshes, sloughs, swales, swamps, or potholes hereinafter occurring is prohibited. The construction of dams, dikes, levees, ditches, canals, channels, and any additional ponds is prohibited.

g. Manipulation of Vegetation Prohibited.

i. Vegetative buffers. Vegetative buffers shall be established and maintained upon lakes, ponds, wetlands, marshes, rivers, streams, and ditches. The area of the vegetative buffer shall extend at least seventy-five feet (75') from the edge of the surface water or wetland. There may be no activity that adversely affects the natural flow of surface or underground waters within the area of the easement.

ii. Leasing. In the event that Landowner desires to lease any portion of the Property, Landowner shall notify the Easement Holder of the proposed lessee and their expected use of the Property. Holder shall approve or disapprove of such lessees within ten (10) days of such notice. Landowner shall also provide the Easement Holder with the name and address of the lessees. Any and all lessees shall lease the Property expressly subject to the terms of this Conservation Easement.

iii. Tree Removal. Except for the cleaning of brush and fence rows for approved firewood collection, dead or diseased tree removal, trail, road, and boundary maintenance, orchard trees, and to remove imminent threats to the safety of persons, animals, or structures, the cutting, removal, or harvesting of trees may be undertaken only pursuant to a written natural resource management plan that has a goal of restoring an old-growth sustainable forest, manages the forest on a single-tree basis, requires the removal of logs from the woods using non-invasive methods that help protect the understory and prevent soil erosion, compaction and degradation and which has been approved by the Holder.

iv. Restoration. The Property may be restored to native vegetation or wetlands pursuant to the Natural Resource Management Plan required by Paragraph 4.a.

h. Animals Prohibited. Dogs as pets are permitted on the Property per the County ordinance. All other animals commonly kept as pets and all livestock and poultry are prohibited.

i. Dumps and Landfills Prohibited. No portion of the Property shall be used for dumps, landfills, or the accumulation, storage, or deposit of waste materials of any kind including trash, inoperative vehicles, vehicle parts, junk, refuse, or radioactive or hazardous waste, except as permitted below. Disposal of any waste materials generated by activities permitted under this Grant shall be in accordance with the requirements of applicable state, county, and local regulations. The composting of organic materials in an area of the Property not to exceed five hundred (500) square feet and the temporary storage of trash generated by the Property in receptacles for periodic off-site disposal shall be permitted without such prior approval. Brush, shrubs, trees, and other vegetation cut from the Property may be composted or burned on the Property.

j. Billboards and Signs Prohibited. The placement of advertising signs or billboards on the Property is prohibited except that, subject to applicable state, county, and local regulations, boundary markers, directional signs, historic, conservation, and recreational markers and explanations, signs stating the name and address of

the Property, signs posted to control unauthorized entry or use of the Property, signs stating the Property is protected by this Grant, and memorial plaques are permitted provided that the signs shall not be lighted.

k. Motor Vehicles Prohibited. Use of motorized vehicles including without limitation snowmobiles, all-terrain vehicles, and motorized cycles on the Property is prohibited except:

i. in connection with permitted activities or uses as provided in this Conservation Easement;

ii. in connection with permitted habitat and resource management and monitoring;

iii. to the extent necessary to assist the physically challenged.

All motor vehicle use shall be limited to parking areas, lanes, and permitted trails as determined by Landowner. Any degradation of the Conservation Values of the Property resulting from motor vehicle use shall be promptly restored.

l. Other Prohibited Uses and Activities. The use of the Property for activities that may impair any of the Conservation Values of the Property, such as but not limited to, use as an aircraft landing or launching site, motorized vehicle race track, golf course, paint-ball games, camping, and other similar activities is prohibited.

m. Commercial Recreational Use Prohibited. The Property may not be used for commercial recreational activity. Low impact, recreational activities that are consistent with the conservation purposes of this Grant, such as hiking, nature observation, cross-country skiing, bird-watching, and hunting are permitted.

n. Incinerators Prohibited. Burning of hazardous, non-organic trash, garbage, or other materials is prohibited except for controlled burning consistent with the Natural Resources Management Plan. The burning of brush piles, and other organic materials generated from activities conducted on the Property and approved in the Natural Resources Plan is permitted consistent with applicable law.

o. Inconsistent Uses Prohibited. No use shall be made of the Property and no activity thereon shall be permitted which, in the reasonable opinion of the Holder is or is likely to become inconsistent with this Grant or will adversely impact the Conservation Values of the Property as stated above.

**3. Reserved Rights of Landowner**. Except as otherwise provided herein, Landowner for itself, its successors, and assigns reserves and shall have and shall be entitled to exercise all of the rights as owner of the Property, including the right to use the Property in any manner not inconsistent with the terms of this Easement and the right to sell, give, transfer, mortgage, or otherwise convey ownership of the Property or any portion thereof or interest therein subject, however, to the limitations and prohibitions of this Grant and the Stewardship Contract. Landowner agrees to notify Holder in advance and in writing before exercising any reserved right that may have an adverse impact on the Conservation Values associated with the Property and this Easement. Without limiting the foregoing, Landowner shall have the following rights:

a. to erect and maintain minor structures such as birdhouses and bird feeders, viewing platforms (up to forty (40) feet high for new structures and eighty (80) feet high if adopted using existing structures) and no larger than 35 feet by 35 feet), informational signs and kiosks, hunting stands and blinds and benches;

b. to remove dead or downed trees on the Property to prevent damage or injury to persons and property;

c. to engage in activities that restore and maintain the natural biological and ecological integrity of the Property; possible activities including the planting and maintenance of native vegetation, management of natural and restored wetlands, and reducing the presence of undesirable vegetation and including the right to revert the agricultural lands to native plant communities for wildlife habitat and scenic and open space, all restoration activity being consistent with the provisions of the Natural Resources Management Plan prepared by a qualified natural resource professional and subject to the approval of the Holder;

d. to construct or place and maintain walking trails on the Property, provided that such trails shall not be constructed in such a way as to obstruct the natural flow of surface water and shall be no wider than six feet and

surfaced with permeable materials such as aggregate or woodchips. Landowner shall have the right to remove brush, branches, trees, and other vegetation so as to construct and place said permitted walking trails, and all necessary steps shall be taken to design and maintain all paths and trails so as to prevent erosion, and any location where erosion occurs shall be promptly restored;

e. Landowner and Holder recognize that Landowner shall retain and reserve all carbon rights or credits, so-called, which may inhere or accrue to the Property.

4. **Affirmative Obligations of Landowner**.

a. Natural Resource Management Plan. Prior to undertaking any activity permitted by this Grant or exercising Reserved Rights that may impact the Conservation Values of the Property including cutting or removing trees and restoring all or portions of the Property to native vegetation, Landowner shall retain a qualified natural resource professional to prepare a natural resource management plan (the "Natural Resource Management Plan" or "the Plan"). Such Plan shall include, by way of example and not limitation, a plan for forest management, restoration of wetlands or other portions of the Property, and the restoration or reintroduction of native species. Landowner shall provide a copy of that Natural Resources Management Plan to the Holder for its approval. The Holder shall provide written notice within fifteen (15) days of receiving the Plan whether it consents to the Plan or provide any objections thereto. The parties will resolve any objections before the plan becomes final. If no notice is provided within twenty (20) days of the Holder receiving the Plan, the Holder will be deemed to have approved of the Plan. The Landowner may not undertake activities under the Plan without having provided notice to the Holder. To the extent allowable under the Stewardship Contract, a forest management plan prepared for Wisconsin's Managed Forest Law program and/or a Conservation Reserve Program plan approved by the United States Natural Resource Conservation Service may be considered elements of a Natural Resource Management Plan. In the absence of a Natural Resources Management Plan prepared by a qualified natural resource professional, the Landowner may undertake limited vegetation management activity provided the landowner shall provide notice to the Holder describing such proposed activity and the Holder shall approve or disapprove of the proposed activity within ten (10) days. The Landowner shall revise the Natural Resources Management Plan as necessary and such revisions shall be approved by the Holder in the same manner as the Plan.

b. Notice of Adverse Impacts. The Holder is to be notified in writing within seven (7) days of discovery of any adverse impact to the Conservation Values of the Property resulting from any permitted activities or activities conducted pursuant to Landowner's reserved rights as described in Paragraph 3 and the Property shall be promptly restored. An adverse condition or impact shall be reported if it is significant or expected to be significant to the Conservation Values of the Property either in isolation or taken together with other events or expected events prior to becoming effective.

5. **Enforcement Remedies**. To enforce the terms of this Easement and otherwise prevent or remediate any violation hereof or activity inconsistent herewith, Holder shall have the following remedies:

a. Notice of Violation. If Holder determines that a violation of the terms of this Easement has occurred or is threatened, Holder shall give written notice to Landowner describing such violation and demanding corrective action sufficient to cure the violation, including where the violation involves damage to the Property resulting from any use or activity inconsistent with the purposes of this Easement, restoration of the Property to its prior condition in accordance with a written plan approved by Holder.

b. Failure to Cure. If Landowner fails to cure the violation within thirty (30) days after receipt of notice thereof from Holder or under circumstances where the violation cannot reasonably be cured within a thirty- (30-) day period, fails to begin curing such violation within the thirty- (30-) day period or thereafter fails to continue diligently to pursue such to completion, Holder may bring an action at law or suit in equity in a court of competent jurisdiction to enforce the terms of this Easement, to enjoin the violation by temporary or permanent injunction, and to require the restoration of the Property to the condition that existed prior to any such violation.

c. Recovery of Damages. Holder shall be entitled to recover damages for violation of the terms of this Easement or injury to any conservation values protected by this Easement, including without limitation, damages for the loss of aesthetic, scenic, or Conservation Values.

d. Emergency Action. If Holder, in its sole discretion, determines that circumstances require immediate action to prevent or mitigate significant damage to the aesthetic, scenic, or Conservation Values of the Property, Holder may pursue any of its remedies under this Section 5 provided, however, that Holder provides Landowner with notice of its exercise of this right and without waiting for the expiration of any period otherwise herein provided for cure or remedy.

e. Remedies Cumulative. Holder's rights under this Section apply equally in the event of either actual or threatened violations of the terms of this Easement. Landowner agrees that Holder's remedies at law for any violation of the terms of this Easement are inadequate and that Holder shall be entitled to the injunctive relief described above in addition to such other relief to which Holder may be entitled, including specific performance of the terms of this Easement, without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies. Holder's remedies described in this Section shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity.

f. Recovery of Costs. All reasonable costs incurred by Holder in enforcing the terms of this Easement, including without limitation costs and expenses of suit and reasonable attorneys' fees and any costs of restoration of the Property shall be borne by Landowner. If Landowner prevails in any action to enforce the terms of this Grant, each party shall be responsible for its own costs.

g. Easement Holder's Discretion. Enforcement of the terms of this Grant shall be at the discretion of Easement Holder, and any forbearance by Easement Holder to exercise its rights under this Easement in the event of any breach of any term of this Grant by Landowner shall not be deemed or construed to be a waiver by Easement Holder of any of Easement Holder's rights under this Grant. No delay or omission by Easement Holder in the exercise of any right or remedy upon any breach by Landowner shall impair such right or remedy or be construed as a waiver.

h. Waiver of Certain Defenses. Landowner hereby waives any equitable defense based on *laches*, balance of harms, estoppel and prescription, and the good faith purchaser defense under Wis. Stat. § 706.09 or any successor provision against any action brought by the Easement Holder with respect to this Easement.

i. The parties desire that any question arising from time to time concerning compliance with the terms of this Easement or any required notice or approval will be resolved through open communication and dialogue rather than unnecessarily formal or adversarial action. To this end, the parties state their mutual intention that if a party develops concerns about an actual or possible noncompliance with the terms of this Easement, wherever reasonably possible, the concerned party will informally notify the other party of the potential problem and explore the possibility of reaching an agreeable resolution prior to invoking the formal steps herein.

ii. If the parties cannot resolve the matter by informal methods and after notice of breach, the parties shall first attempt to resolve any disputes by mediation. The parties shall agree on a single mediator who shall be an attorney licensed to practice law in Wisconsin who has experience with conservation easements including applicable tax law and training and experience in mediation. Mediation shall be conducted in Sheboygan County, Wisconsin.

iii. If the dispute has not been resolved by mediation within sixty (60) days after the first substantive meeting of the parties with the mediator, or if the parties are unable to agree to a mediator within sixty (60) days after the formal notice of breach, then, *if the parties agree*, the dispute shall be resolved by binding arbitration in accordance with the State Uniform Arbitration Act, and judgment upon the award rendered by the arbitrator may be enforced in any state court of competent jurisdiction.

iv. At any point in time the parties may take appropriate legal action, including an injunction to stop the alleged violation. Any costs incurred by Holder in enforcing the terms of this Easement against Landowner including without limitation any costs of restoration necessitated by Landowner's violation of the terms of this Easement shall be borne by Landowner unless the deciding body determines that Holder has acted in bad faith in seeking to enforce this Easement.

v. Holder's remedies described in this Paragraph shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity, including the right to recover any damages for loss of Conservation Values. The failure of Holder to discover a violation or to take action shall not waive any of Holder's rights, claims, or interests in pursuing any such action at a later date.

6. **Representations and Warranties**. Landowner represents and warrants that:

a. Hazardous Substances. To the best of Landowner's actual knowledge, no substance constituting a hazardous, toxic, polluting, or otherwise contaminating substance has been released, generated, disposed of, or abandoned on the Property. Landowner does use gasoline and motor oil for operating and maintaining agricultural vehicles and equipment and uses herbicides in connection with land management activities and to periodically control invasive plant species.

b. Underground Storage Tanks. There are not now and to the best of Landowner's knowledge, have never been any underground storage tanks located on the Property, whether presently in service or closed, abandoned, or decommissioned, and no underground storage tanks have been removed from the Property in a manner not in compliance with applicable federal, state, and local laws, regulations, and requirements applicable to the Property and its use.

c. Compliance with Laws. To the best of Landowner's knowledge, the Property and Landowner's use thereof are now and since September 12, 2014, have been in compliance with all federal, state, and local laws, regulations, and requirements applicable to the Property and its use.

d. Absence of Litigation. There is no pending or threatened litigation in any way affecting, involving, or relating to the Property or Landowner's landownership or use thereof.

e. No Pending Proceedings. No civil or criminal proceedings or investigations are now pending, and no notices, claims, demands, or orders have been received arising out of any violation or alleged violation of or failure to comply with any federal, state, or local law, regulation, or requirement applicable to the Property or its use, nor do there exist any facts or circumstances that Landowner might reasonably expect to form the basis for any such proceedings, investigations, notices, claims, demands, or orders.

7. **Control**. Nothing in this Easement shall be construed as giving rise, in the absence of a judicial decree, to any right or ability in Holder to exercise physical or managerial control over the day-to-day operation of the Property or any of Landowner's activities on the Property or otherwise to become an operator with respect to the Property within the meaning of the Comprehensive Environmental Response; Compensation, and Liability Act of 1980 as amended or similar law imposing legal liability on the Landowner or operator of real property.

8. **Extinguishment and Condemnation**.

a. Extinguishment. If circumstances arise in the future that render the purpose of this Easement impossible to accomplish, this Easement can only be terminated or extinguished, whether in whole or in part, by judicial proceedings in a court of competent jurisdiction.

b. Condemnation. If all or any part of the Property is taken by exercise of the power of eminent domain or acquired by purchase in lieu of condemnation, whether by public, corporate, or other authority so as to terminate this Easement, in whole or in part, Landowner and Holder shall act jointly to recover the full value of the interests in the Property subject to the taking or purchase in lieu and all direct or incidental damages resulting therefrom. All expenses reasonably incurred by Landowner and Holder in connection with the taking or purchase in lieu shall be paid out of the amount recovered.

c. Use of Proceeds. In the event that the Grant is extinguished by changed circumstances or condemnation and compensation for the Property is paid to Holder, Holder shall use that compensation to protect the Conservation Values of any similar or comparable property.

9. **Hold Harmless**. Landowner hereby agrees to indemnify and hold harmless Holder and its members, directors, officers, employees, agents, volunteers, and contractors (collectively the "Indemnified Parties") from and

against any and all liabilities, penalties, charges, costs, losses, damages, expenses, causes of action, claims, demands, orders, judgments, or administrative actions, including without limitation reasonable attorneys' fees arising from or in any way connected with

a. injury to or the death of any person, or physical damage to any property resulting from any act, omission, condition, or other matter related to or occurring on or about the Property regardless of cause unless due to the negligence of any of the Indemnified Parties;

b. the violation or alleged violation of or other failure to comply with any state, federal, or local law, regulation, ordinance, or requirement by any person other than any of the Indemnified Parties in any way affecting, involving, or relating to the Property; and

c. the presence or release in, on, from, or about the Property at any time of any substance now or hereafter defined, listed, or otherwise classified pursuant to any federal, state, or local law, regulation, ordinance, or requirement as hazardous, toxic, polluting, or otherwise contaminating or harmful to human health or the environment unless caused solely by any of the Indemnified Parties.

**10. Assignment of Easement.** This Easement is transferable but Holder may assign its rights and obligations under this Easement only to an organization that is a qualified organization at the time of transfer under applicable provisions of the Internal Revenue Code (or any successor provision then applicable) and authorized to acquire and hold conservation easements under Wis. Stat. § 700.40 or any successor provisions thereto or under the laws of the United States. In the event that Holder loses its tax-exempt status, is dissolved, ceases to be qualified to be a holder of the conservation easement or the parties otherwise agree, Ozaukee Washington Land Trust ("OWLT") shall become the Holder of this conservation easement pursuant to a Memorandum of Understanding entered into and recorded on the same date hereof.

**11. Subsequent Transfers of Property.** Landowner and each subsequent Landowner of the Property shall incorporate the terms of this Easement by reference in any deed or other legal instrument by which such Landowner divests any interest in all or in a portion of the Property, including without limitation a leasehold interest. Landowner further agrees and each subsequent Landowner of the Property by taking title thereto shall be agreeing to give written notice to Holder of the transfer of any interest in the Property at least thirty (30) days prior to the date of such transfer.

**12. Notices.** Any notice or other communication required or permitted hereunder shall be in writing and either served personally or sent by first class mail, postage prepaid, addressed as follows:

a. To Landowner: Sheboygan County
County Administrator
508 New York Avenue
Sheboygan, WI 53081-4126

b. to Holder: Glacial Lakes Conservancy, Inc.
529 Ontario Avenue
Sheboygan, WI 53081

or to such other address as either party from time to time shall designate by written notice to the other.

**13. Recordation.** Holder shall record this instrument in the office of the Register of Deeds for Sheboygan County at Holder's expense within two (2) business days of execution hereof.

**14. Easement Binding on Successors.** The benefits and burdens of the covenants, terms, conditions, and restrictions of this Easement are intended to and shall be binding upon and inure to the benefit of the parties hereto and their respective personal representatives, heirs, successors, and assigns and shall continue as a servitude running in perpetuity with the Property. The terms "Landowner" and "Holder" wherever used herein, and any pronouns used in place thereof, shall include respectively the above-named Landowner and Landowner's personal representatives, heirs, successors, and assigns and Holder and its successors and assigns.

**15. Taxes and Liens**. Landowner shall pay and discharge when due all property taxes and assessments imposed upon the Property and any uses thereof and shall avoid the imposition of any liens that may affect Holder's rights hereunder. Landowner shall keep the Property free of any liens or encumbrances including without limitation those arising out of any work performed for, materials furnished to, or obligations incurred by Landowner. Holder may at its discretion pay any outstanding taxes or assessments and shall then be entitled to reimbursement by Landowner. The foregoing notwithstanding, the Landowner may mortgage the Property.

**16. General Provisions**.

a. Definitions.

i. *Structures* means anything that is built or constructed by humans from wood, metal, stone, concrete, plastic, or any other substance which is not a natural element of the environment and which is intended to be permanent or semi-permanent and includes but is not limited to all buildings, roads and trails, fences, gates, poles, towers, fences, utility infrastructure, gardens, play equipment, ponds, and any similarly constructed element.

ii. *Commercial activity* means actions undertaken for the purpose of providing a product or service to the public by operating a business or generating a profit.

iii. *Native plants* are those that were growing naturally in the Sheboygan County area before humans introduced plants from distant places.

b. Construction Favoring Validity. Any general rule of construction to the contrary notwithstanding, this Easement shall be liberally construed in favor of the Easement to affect the purposes of this Easement and the policy and purpose of the Wisconsin Conservation Easement Act, Wis. Stat. § 700.40 (2013). If any provision in this instrument is found to be ambiguous, an interpretation consistent with the purposes of this Easement that would render the provision valid shall be favored over any interpretation that would render it invalid. If any provision of this Easement or the application thereof to any person or circumstances is found to be invalid, the remainder of the provisions of this Easement, or the application of such provision to persons or circumstances other than those as to which it is found to be invalid, as the case may be, shall not be affected thereby.

c. Entire Agreement. This instrument sets forth the entire agreement of the parties with respect to this Easement and supersedes all prior discussions, negotiations, understandings, or agreements relating thereto, all of which are merged herein.

d. Recitals and Exhibits Incorporated Herein. Any and all Recitals in this Grant of Conservation Easement are agreed by the parties to be accurate, are incorporated into this Easement by this reference, and shall constitute integral terms and conditions of this Easement. Any and all exhibits and addenda attached to and referred to in this Easement are hereby incorporated into this Easement as if fully set out in their entirety herein.

e. No Reversion. Nothing contained herein shall result in a forfeiture or reversion of Landowner's title to the Property in any respect.

f. Paragraph Headings. The paragraph headings in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon construction or interpretation of this Easement.

g. Counterparts. The parties may execute this instrument in two or more counterparts which shall, in the aggregate, be signed by both parties, and each counterpart shall be deemed an original instrument as against any party who has signed it. In the event of any disparity between the counterparts produced, the recorded counterpart shall be controlling.

h. Governing Law. The construction and validity of this Easement shall be governed by the laws of the State of Wisconsin.

i. Effect. This Easement shall be effective upon Landowner's execution hereof and upon Holder's acceptance hereof.

j. Advisory Committee. The Landowner agrees that so long as it maintains the Amsterdam Dunes Advisory Committee, at least one person nominated by the Holder shall serve on such committee.

k. Notices for Approvals. Whenever the Landowner is required to give a notice of proposed action to Holder in order to obtain Holder's approval of a proposed action, in the event that the Holder does not provide a response to Landowner within the time provided, plus thirty (30) days, the Landowner may proceed with the proposed action as though approval was formally provided.

**17. Assignment of Stewardship Grant and Management Contract.** The parties acknowledge that the Property was purchased in part with State of Wisconsin Knowles-Nelson Stewardship funds and is therefore subject to the Stewardship Contract, recorded as Document #20004152 in the Office of the Sheboygan County Register of Deeds, a copy of which is adopted by reference herein. Landowner has obtained written approval from the Wisconsin Department of Natural Resources to grant this Conservation Easement pursuant to Essential Provision 1b of the Stewardship Contract. Landowner has executed an Assignment of the Stewardship Grant and Management Contract and shall hold Property Easement Holder harmless for any liability attributable thereto. This Grant of Conservation Easement is intended to complement the Stewardship Contract. Any conflicts between the substantive terms of this Conservation Easement and the Stewardship Contract shall be resolved in favor of the Stewardship Contract except that, if both documents address the same subject, the provision which extend the greater adherence to the Conservation Values shall control.

**18. Amendment.** If circumstances arise causing the parties to determine that an amendment to or modification of this Easement would be appropriate, Landowner and Holder may amend this Easement by a written instrument recorded in the office of the Register of Deeds for Sheboygan County provided that any such amendment shall not diminish the conservation values, goals, purposes, or benefits of the Easement in any manner, affect its perpetual duration, or affect the qualification of this Easement or the status of Holder under Section 501(c)(3) of the Internal Revenue Code of 1986 or any successor provision.

**TO HAVE AND TO HOLD** unto Easement Holder, its successors and assigns forever,

**IN WITNESS WHEREOF** Landowner and Easement Holder have set their hands on the day and year first above written.

**LANDOWNER:** SHEBOYGAN COUNTY

By: _____
Roger Te Stroete, Board Chairman

By: _____
Jon Dolson, County Clerk

STATE OF WISCONSIN )
) ss:
SHEBOYGAN COUNTY )

Personally came before me this 9th day of July, 2015, the afore-named **Roger Te Stroete** and **Jon Dolson** to me known to be the Sheboygan County Board Chairman and County Clerk, respectively, who executed the foregoing instrument and acknowledged the same.

Notary Public, State of Wisconsin
My Commission is permanent/~~expires~~ _____

**ACCEPTANCE**

**IN WITNESS WHEREOF**, Holder hereby accepts Holder's interest in this Grant of Conservation Easement as of this 9th day of July, 2015.

**HOLDER:** GLACIAL LAKES CONSERVANCY, INC.

By: _____
Christine Krieg, Board President

By: _____
Mary Piehl, Executive Director

STATE OF WISCONSIN )
) ss:
SHEBOYGAN COUNTY )

Personally came before me this 9th day of July, 2015, the above-named **Christine Krieg** and **Mary Piehl** to me known to be the Board President and Executive Director, respectively, of Glacial Lakes Conservancy, Inc., who executed the foregoing instrument and acknowledged the same.

Notary Public, State of Wisconsin
My Commission is permanent/~~expires~~ _____

Drafted by:

Attorney Carl K. Buesing
Office of the Corporation Counsel
SHEBOYGAN COUNTY
2124 Kohler Memorial Drive – Suite 110
Sheboygan, WI 53081-3174

State Bar No. 1017939
Phone: (920) 459-3093
Fax: (920) 457-8411

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**Exhibit A – Legal Description**

Part of government lots 2 and 3, section 31, T13N, R23E, Town of Holland, Sheboygan County, Wisconsin.

Beginning at the W ¼ corner section 31, T13N, R23E; thence N00°39'25"E, along the west line government lot 2, section 31, 208.37 feet to the south line of Iowa Street according to the Plat of Clear-Vue Resort; thence N89°55'14"E, along said south line, 533.60 feet; thence S00°01'41"W 883.78 feet; thence S83°39'52"E 434.68 feet; thence S00°04'06"E 103.79 feet; thence S89°47'00"E 742.98 feet to the west line of the Plat of Clear-Vue Resort; thence S00°31'09"E, along said west line 507.91 feet to the south line of Government lot 3; thence N89°29'16"W, along said south line, 1731.43 feet to the west line government lot 3, section 31; thence N00°41'49"E, along said west line, 1321.77 feet to the point of beginning, and containing 33.99 acres, including therein, 1.16 acres lying within the right of way of Sauk Trail Road.

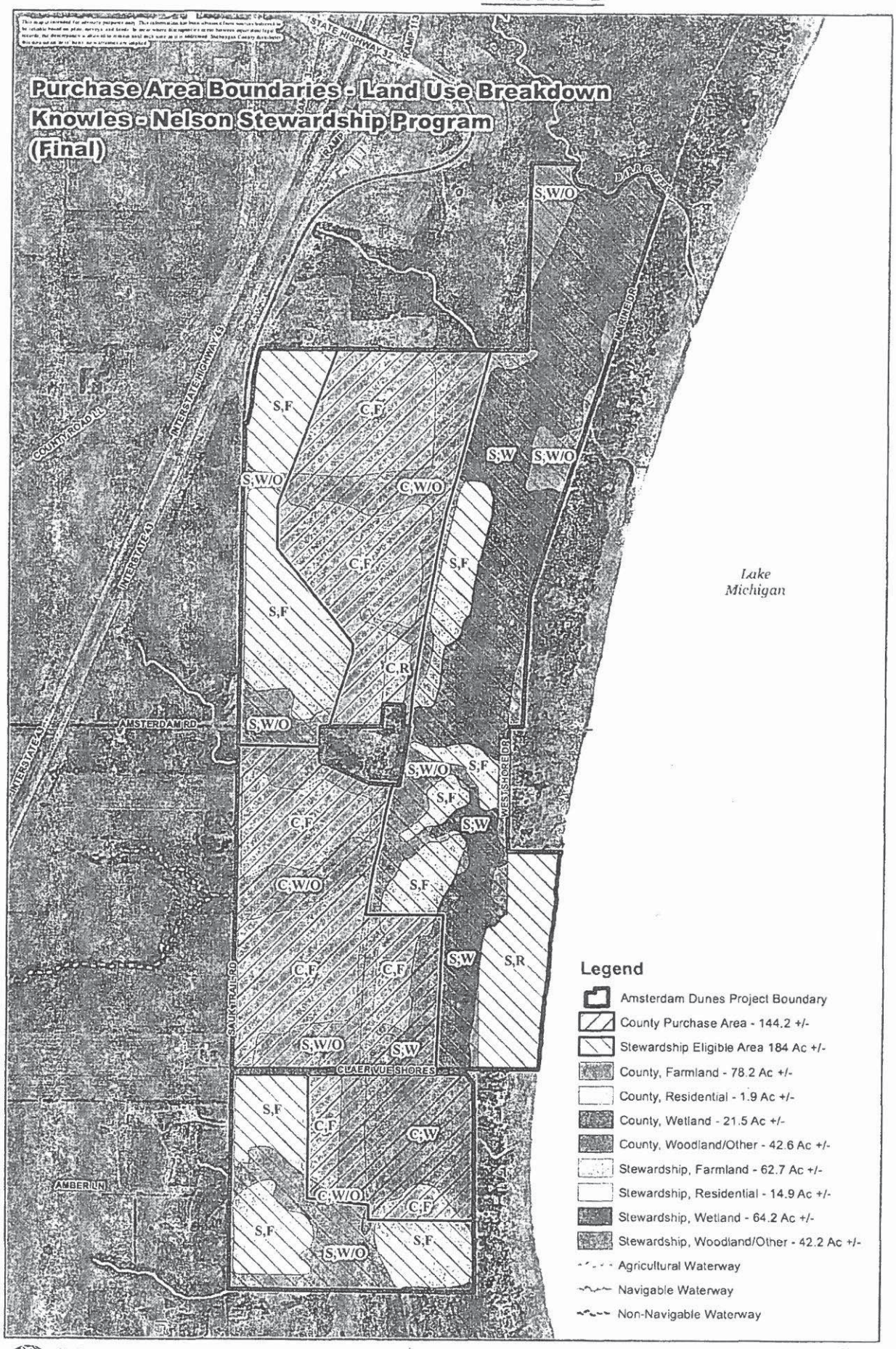
Also:
Part of the SW ¼ SW ¼, part of government lots 2, 3, and 4, and part of the vacated portion of the Plat of Amsterdam, all in section 30, and part of government lots 1 and 2, section 31, all in T13N, R23E, Town of Holland, Sheboygan County, Wisconsin.

Commencing at the W ¼ corner section 31, T13N, R23E; thence N00°39'25"E, along the west line government lot 2, section 31, 241.37 feet to the north line of Iowa Street according to the Plat of Clear-Vue Resort: thence N89°55'14"E, along said north line, 1432.94 feet to the point of beginning:
Thence, continuing N89°55'14"E, along the north line of Iowa Street, 298.25 feet; thence N00°29'58"W 8.50 feet; thence N89°55'14"E 389.33 feet, more or less, to the water's edge of lake Michigan; thence northeasterly, along said water's edge, 1535 feet more or less; thence S89°58'59"W 400 feet, more or less to the southeast corner of The Shores of Amsterdam Dunes, a subdivision plat; thence N89°57'06"W, along the south line of said subdivision plat, 66.00 feet; thence N00°02'54"E, along the west line of said subdivision plat, 877.69 feet to the northwest corner of The shores of Amsterdam Dunes; thence N89°55'44"E, along the south line section 30, 160.85 feet; thence N02°45'50"E, along the west line of Marine Drive according to the Plat of Longfield Shores, 924.78 feet; thence N17°54'20"E, along the west line of Marine Drive, 2970 feet, more or less, to the centerline of Bahr Creek; thence northwesterly, along said centerline, 950 feet more or less, to the north line of government lot 2, section 30; thence S89°56'57"W, along said north line, 325 feet, more or less; thence S00°50'04"W 1322.50 feet to the north line government lot 3; thence N89°58'47"W, along said north line, 255.17 feet; thence S14°51'53"W 939.43 feet; thence S17°26'18"W 57.53 feet; thence S11°56'25"W 559.55 feet; thence S09°19'34"W 678.06 feet; thence S08°32'13"W 479.73 feet to the north line section 31, T13N, R23E; thence S09°26'09"W 419.97 feet; thence N85°43'49"W 53.68 feet; thence S10°27'06"W 931.47 feet to the north line of government lot 2, section 31; thence S89°57'46"E, along said north line, 542.47 feet; thence S02°23'33"W 1080.87 feet to the point of beginning, and containing 115.5 acres of land, more or less, including therein 0.9769 acres lying within the right of way of Amsterdam Road.

Also:
Part of government lot 1, section 31, and part of the SW ¼ SW ¼ and part of the NW ¼ SW ¼ section 30, T13N, R23E, Town of Holland, Sheboygan County, Wisconsin.

Beginning at the NW corner section 31; thence S00°39'25"W, along the west line of government lot 1, section 31, T13N, R23E, 131.59 feet; thence S89°20'36"E 576.67 feet; thence N00°28'08"E 138.91 feet to the south line section 30; thence N89°55'44"E, along said south line, 55.17 feet; thence N17°42'28"E 547.48 feet; thence North 62.78 feet; thence N38°32'13"W 859.08 feet; thence North 306.41 feet; thence N20°41'53"E 1167.56 feet to the north line SW ¼ section 30; thence N89°58'47"W, along said north line, 533.19 feet to the east line of Sauk Trail Road; thence 381.80 feet southwesterly, along the arc of a curve to the left, said curve having a radius of 1372.39 feet, and a main chord which bears S08°37'21"W 380.57 feet; thence S11°12'45"W 147.33 feet; thence N89°20'50"W 32.29 feet to the west line SW ¼ section 30; thence S00°38'58"W, along said west line, 2135.61 to the point of beginning, and containing 31.56 acres of land, including therein 2.50 acres lying within the existing right of way of Sauk Trail Road, and Amsterdam Road.

EXHIBIT B




Sheboygan County, Wisconsin

2/13/2015
Source: Sheboygan County

Amsterdam Dunes Property
Sections 30 & 31 Town of Holland East
Sheboygan County

0 300 600'

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