

**ASSESSMENT PLAN:
LOWER FOX RIVER/GREEN BAY NRDA**

Prepared for:

U.S. Fish and Wildlife Service
Region 3
Fort Snelling, MN 55111

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ACRONYMS

AET	apparent effects threshold
AM	assessment manager
ARS	accumulation relative to sediments
AWQC	Ambient Water Quality Criteria
CDF	confined disposal facility
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	chain-of-custody
CFR	Code of Federal Regulations
CV	Contingent Valuation
CWA	Clean Water Act
DOI	Department of Interior
DQO	data quality objective
FCA	Fish Consumption Advisory
FDA	Food and Drug Administration
FR	Federal Register
FTL	Field Team Leader
FWPCA	Federal Water Pollution Control Act
GBMBS	Green Bay Mass Balance Study
GC/ECD	gas chromatography/electron capture detection
GC/MS	gas chromatography/mass spectrophotometry
GLFC	Great Lakes Fishery Commission
GLNPO	U.S. EPA Great Lakes National Program Office
GLWQG	Great Lakes Water Quality Guidance
HCC	human cancer criterion
IJC	International Joint Commission
kg	kilogram
l	liter
LEL	lowest effect level
LLBDM	Little Lake Butte des Morts
MDL	method detection limit
mg	milligram
MITW	Menominee Indian Tribe of Wisconsin
MS/MSD	matrix spike/matrix spike duplicate
NBS-GLSC	National Biological Survey, Great Lakes Science Center
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
ng	nanogram

NOAA	National Oceanic and Atmospheric Administration
NRDA	natural resource damage assessment
NTR	National Toxics Rule
OPA	Oil Pollution Act of 1990
OTIW	Oneida Tribe of Indians of Wisconsin
PCB	polychlorinated biphenyl
PI	Principal Investigator
pg	picogram
PM	project manager
PRP	potentially responsible party
QA/QC	quality assurance/quality control
QAPjP	Quality Assurance Project Plan
QAM	Quality Assurance Manual
%R	average percent recovery
RCDP	Restoration and Compensation Determination Plan
RI/FS	remedial investigation/feasibility study
RPD	relative percent difference
RSD	relative standard deviation
SDWA	Safe Drinking Water Act
SOP	standard operating procedure
SRM	standard reference material
SWDA	Solid Waste Disposal Act
TSA	technical system audit
TSCA	Toxic Substances Control Act
U.S. ACOE	U.S. Army Corps of Engineers
U.S. EPA	U.S. Environmental Protection Agency
U.S. FWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDHHS	Wisconsin Department of Health and Human Services
WDNR	Wisconsin Department of Natural Resources
WTP	willingness to pay

CHAPTER 1 INTRODUCTION

The U.S. Fish and Wildlife Service (U.S. FWS) of the Department of the Interior (DOI), the Menominee Indian Tribe of Wisconsin (MITW), and the Oneida Tribe of Indians of Wisconsin (OTIW) are preparing to assess damages to natural resources that have resulted from releases of hazardous substances to the Lower Fox River, Green Bay, and Lake Michigan and other areas containing natural resources potentially injured by hazardous substances released to the Lower Fox River (collectively known as the assessment area). The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) [42 U.S.C. §§ 9607], the Federal Water Pollution Control Act (CWA) [33 U.S.C. § 1321], and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) provide authority to the DOI, the MITW, and the OTIW (collectively, “the trustees”) to seek such damages.

The assessment plan is designed to be in accordance with natural resource damage assessment (NRDA) regulations promulgated by the DOI at 43 CFR Part 11.

1.1 BACKGROUND

The assessment planning process represents the second phase of the NRDA process. In the preassessment phase, which was the first phase of the NRDA process, the trustees made the determination to proceed with this assessment, concluding — based on a rapid review of readily available data [43 CFR § 11.23(b)] — that there is a reasonable probability of making a successful claim for damages [43 CFR § 11.23(b)]. Specifically, the trustees made the following determinations:

1. **Releases of hazardous substances to the assessment area have occurred [43 CFR § 11.23(e)(1)].**
 - ▶ Numerous investigators, including the U.S. FWS, the State of Wisconsin [including the Wisconsin Department of Natural Resources (WDNR)], and the U.S. Environmental Protection Agency (U.S. EPA) have demonstrated that multiple releases of polychlorinated biphenyls (PCBs), a listed hazardous substance, have occurred and continue to occur at and near the assessment area.
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2. **Natural resources for which trustees can assert trusteeship have been, or are likely to have been, adversely affected by the releases of hazardous substances [43 CFR § 11.23(e)(2)].**
 - ▶ Natural resources are likely to have been adversely affected by releases of hazardous substances include, but are not limited to, endangered species, migratory birds, surface water, sediments, plankton, benthic macroinvertebrates, fish, and wildlife.
3. **The quantity and concentration of the released substances are sufficient to potentially cause injury to those natural resources [43 CFR § 11.23(e)(3)].**
 - ▶ Numerous investigations in the Fox River, Green Bay, and Lake Michigan have documented the presence of hazardous substances at concentrations sufficient to potentially injure natural resources in the assessment area.
4. **Data sufficient to pursue an assessment are readily available or obtainable at reasonable cost [43 CFR § 11.23(e)(4)].**
 - ▶ Studies have been conducted in the Fox River, Green Bay, and Lake Michigan by the WDNR, U.S. EPA, and U.S. FWS which will be available at reasonable cost and will be used to the extent practicable in the NRDA. The assessment will build on these information sources to identify and evaluate potential injuries, determine exposure pathways, quantify resulting damages to the public, and develop a plan to restore injured natural resources. Additional assessment costs are likely to be reasonable, as defined by DOI regulations [43 CFR § 11.14(ee)], because preliminary estimates indicate that sediment restoration costs alone will exceed the assessment costs and the benefits of additional assessment activities outweigh the additional costs.
5. **Response actions carried out or planned will not sufficiently remedy the injury to natural resources without further action [43 CFR § 11.23(e)(5)].**
 - ▶ Neither U.S. EPA nor WDNR has carried out or planned response actions under the CWA or CERCLA that will sufficiently remedy the injury to natural resources without further action.

1.2 PURPOSE OF THE ASSESSMENT PLAN

The purpose of an NRDA assessment plan is to ensure that the assessment is performed in a planned and systematic manner and that the methodologies selected for use in the assessment can be conducted at a reasonable cost [43 CFR § 11.30(b)]. The Assessment Plan addresses the

Trustees' overall assessment approaches and emphasizes the utilization of existing data. If determined to be necessary, the Trustees may modify the assessment plan [43 CFR § 11.32(e)].

1.3 ORGANIZATION OF THE ASSESSMENT PLAN

This Assessment Plan is organized as follows. Chapter 2 briefly presents background information on natural resources involved in the assessment, the assessment area, hazardous substances released, and the history of pulp and paper mills in the assessment area. Chapter 3 describes the authority of the trustees to proceed with the assessment. Chapter 4 identifies coordination efforts with other agencies and previous actions taken by the trustees as part of the NRDA process. Chapter 5 contains documentation of the Trustee decision to proceed with a type B assessment. Chapter 6 provides confirmation that natural resources have been exposed to hazardous substances released from the site. Chapter 7 provides a preliminary determination of the recovery period for injured natural resources. Chapters 8 and 9 provide overviews of approaches to be employed by the trustees in the injury and damage assessment process, respectively. Chapter 10 contains a quality assurance project plan for the NRDA. Chapter 11 references literature cited in the Plan.¹

1.4 PUBLIC REVIEW AND COMMENT

This Assessment Plan is available for review and comment by potentially responsible parties (PRPs), other natural resource trustees, other affected federal or state agencies or Native American tribes, and any interested members of the public for a period of 30 days.

Comments may be submitted in writing to:

Frank J. Horvath
U.S. Fish and Wildlife Service
Region 3 (attn: ES/EC-NRDA)
B.H.W. Whipple Federal Building
1 Federal Drive
Fort Snelling, MN 55111

Comments must be received by 30 days from the date the notice of availability is published in the Federal Register.

1. Literature is cited in the text using the convention: Name (Date) or (Name, Date), where "Name" is the last name of the lead author(s) of the publication, and "Date" refers to the date of publication. For example, the citation (Smith, 1996) refers to a publication authored by Smith in 1996. Full citations are provided in Chapter 11 of the Assessment Plan.

CHAPTER 2 BACKGROUND INFORMATION ON NATURAL RESOURCES AND THE ASSESSMENT AREA

2.1 LOCATION AND DESCRIPTION OF THE ASSESSMENT AREA

The assessment area for the Lower Fox River/Green Bay NRDA includes the Lower Fox River, Green Bay, Lake Michigan, and other areas containing natural resources potentially injured by hazardous substances released to the Lower Fox River (Figure 2-1). The Lower Fox River is 39 miles long (Figure 2-2) (Bierman et al., 1992). Green Bay is 119 miles long with a maximum width of 23 miles (Figure 2-3) (Bierman et al., 1992) and an approximate surface area of 1500 square miles (Swackhamer and Armstrong, 1987). Because Green Bay empties into Lake Michigan, resources that are exposed in Green Bay may be found in Lake Michigan. In addition, trust resources may be located adjacent to or near the Fox River, Green Bay, and Lake Michigan. Finally, trust resources in Lake Michigan may be exposed to hazardous substances that were originally released into the Lower Fox River and Green Bay and then transported to Lake Michigan.¹ For example, migratory birds nesting in locations adjacent to the assessment area may be injured by releases of hazardous substances from the assessment area. Other trust resources including fish and wildlife may be exposed in the Lower Fox River or Green Bay and migrate up tributaries or travel beyond the immediate vicinity of the river and bay. If further information becomes available that suggests that the geographic scope should be modified, the extent of the assessment area will be evaluated and adjusted as appropriate.

2.2 HAZARDOUS SUBSTANCES RELEASED

Hazardous substances released into the assessment area include, but may not be limited to, PCBs (including Aroclor 1242). PCBs, including Aroclor 1242, are listed as hazardous substances at 40 CFR § 302.4, pursuant to section 102(a) of CERCLA and section 311(b)(2) of the CWA. PCB releases from area paper mills have occurred directly and indirectly as a consequence of the recycling of waste paper contaminated with PCBs. This assessment plan focuses on PCBs. However, other hazardous substances may be identified and considered by the trustees at a later date.

1. One study has indicated that the Fox River provides the greatest loading of PCBs to Green Bay (Bierman et al., 1992). In addition, a 1983 study estimated that the Fox River contributes 60% of Lake Michigan's tributary PCB load (Marti, 1984, as cited in Allen et al., 1987).

Figure 2-1
Map Showing Lower Fox River/Green Bay Assessment Area

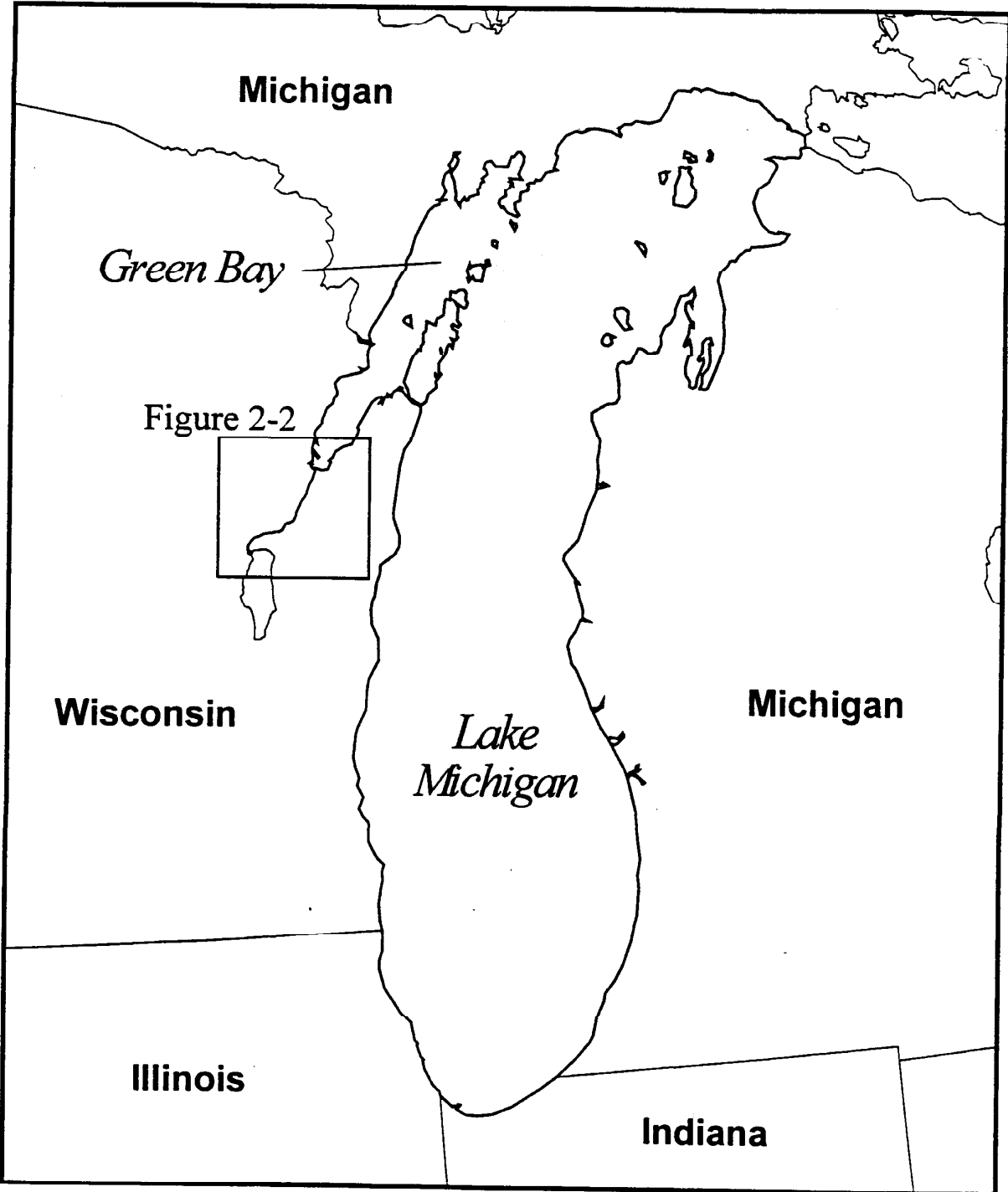


Figure 2-2
Detailed Map of Lower Fox River/Inner Green Bay and Paper Mills

