Natural Resource Restoration in Indiana's Great Lakes Watershed Freshwater Mussel Augmentation

Restoration Plan

January 2026

Department of the Interior
U.S. Fish and Wildlife Service

Indiana Department of Environmental Management

Indiana Department of Natural Resources

Table of Contents

Introduction 1
Natural Resource Trustee Authority 2
Summary of NRDAR Settlements 2
Public Participation 2

Affected Environment and Summary of Injury to Natural Resources 3

Restoration Goals 7

Project Coordination 8

Proposed Restoration Alternatives 8
Restoration Development and Evaluation 8
Criteria for Identifying and Evaluating Restoration Alternatives 8
Alternative 1: No Action Alternative (no mussel augmentation efforts) 10
Alternative 2: Freshwater Mussel Augmentation Only in the Grand Calumet River 10
Alternative 3: Freshwater Mussel Augmentation in Indiana's Great Lakes Watershed (Selected) 10

Summary of Environmental Consequences 11
Alternative 1: No Action Alternative (no mussel augmentation efforts) 11
Alternative 2: Freshwater Mussel Augmentation Only in the Grand Calumet River 12
Alternative 3: Freshwater Mussel Augmentation in Indiana's Great Lakes Watershed (Selected) 12

Environmental Compliance 12

Monitoring 13

Project Contacts 13

Literature Cited 13

List of Figures

Fig. 1. In 1999, the Trustees spent a great deal of effort examining the species diversity of benthic invertebrates. We found very few live specimens of non-native invasive mussels (*Corbicula* and *Dressinia* sp.) 4

Fig. 2. A sediment coring transect from the Grand Calumet River near the southwest corner of the Gary Chicago Airport in which one sediment core also found remnant mussel shells. 5

Fig. 3. Relict shells of Wabash pigtoe (Fusconaia flava) and spike (Eurynia dilatata) were found in a Grand Calumet River sediment core (GC99T03L3) near the southwest corner of the Gary Chicago Airport. These shells were found below 10.25' of seriously degraded, industrially generated sediments. More than 4' of visibly clean, sandy sediments were observed below these shells 5

Fig. 4. October 2002 West Branch Grand Calumet River sediment coring found lots of small freshwater bivalve molluscs in the order Sphaeriida below 6' of industrially generated sediments 6

Fig. 5. Paper pond shell fragments from Roxana Marsh found below more than 5' of industrially generated sediments 6

List of Tables

Table 1. Species that have been found live in the Grand Calumet River since the implementation of a sediment cap in portions of the river 7

Appendix

Appendix 1. Environmental Action Statement 15

Introduction

Consistent with the 1997 Memorandum of Agreement between the Indiana Department of Environmental Management (IDEM), the Indiana Department of Natural Resources (IDNR), and the US Fish and Wildlife Service (USFWS), on behalf of the Department of the Interior (collectively the "Trustees") have prepared this Restoration Plan (RP) to identify and analyze proposed restoration initiatives that will restore natural resources injured and ecosystem services lost due to releases of hazardous substances and discharges of oil within the Great Lakes watershed.

This RP proposes restoration initiatives for augmentation of freshwater mussel populations in or near the Great Lakes watershed, where they were once found. Produced mussels will benefit the Great Lakes watershed and the State of Indiana more broadly. Mussel restoration is a critical component of aquatic ecosystem recovery given mussels' ecological role in improving water quality, stabilizing sediments, and enhancing biodiversity.

Specifically, this RP seeks to utilize funds from the 2003 and 2005 Grand Calumet River Natural Resource Damage settlements described herein, to implement new native mussel augmentation projects. These actions are designed to restore injured benthic communities and advance long-term ecological resilience in the Great Lakes watershed and may include areas outside the watershed that can produce mussels to benefit this watershed and the State of Indiana.

Pursuant to the applicable regulations, the Trustees developed and Restoration and Compensation Determination Plan in 2004 (RCDP; Trustees 2004) for the Grand Calumet River/Indiana Harbor Canal (GCR/IHC) Natural Resource Damage Assessment (NRDA). The purpose of the RCDP was to evaluate restoration alternatives against a variety of criteria. That RCDP analysis of two decades ago still is directly relevant to this RP's evaluation of environmental consequences of proposed mussel augmentation initiatives. In this RP, the Trustees present and evaluate proposed mussel restoration initiatives alongside other alternatives for the Great Lakes Watershed, which includes the GCR/IHC Site.

The Trustees did a thorough analysis of the possible alternatives in the 2004 RCDP, including on-site and replacement restorations. The Trustee's preferred alternative has been to implement as much on-site restoration to the extent possible. The Trustees have spent more than $66M in on-site restoration, which attracted more than $190M in matching funds through the U.S. Environmental Protection Agency's (USEPA's) administration of the Great Lakes Restoration Initiative (GLRI) and more than $30M in company and municipal contributions. The Trustees are committed to maintaining the completed on-site restoration work and are continuing to explore options of replacement restoration to address the continuing losses to surface water and aquatic biological resources.

The Trustees are soliciting public input on the restoration initiatives proposed herein. The public comment period for this RP will be open for more than 30 days in January and February 2026.

Natural Resource Trustee Authority

Under federal law, the Trustees are authorized to act on behalf of the public to assess injuries to natural resources and services resulting from the release of hazardous substances and releases of hazardous substances and discharges of oil into the environment. The Trustees for Natural Resources Damage Assessment and Restoration (NRDAR) are the State of Indiana, represented by IDNR and IDEM, and the Department of the Interior, represented by USFWS. The NRDAR process allows Trustees to pursue claims against responsible parties for monetary damages based on these injuries in order to compensate the public. The initiatives proposed in this mussel-focused restoration plan are intended to compensate the public for the injury to freshwater mussels that have long been reduced or extirpated from Lake Michigan's watershed as a result of releases of hazardous substances or discharges of oil.

The Federal Water Pollution Control Act (CWA, commonly known as the Clean Water Act) [33 U.S.C. §§ 1251-1387] and its implementing regulations (40 C.F.R. Part 300 and 43 C.F.R. Part 11) authorize states, federally recognized Tribes, and certain federal agencies with authority to manage or control natural resources, to act as "Trustees" on behalf of the public, and to restore, rehabilitate, replace, and/or acquire natural resources equivalent to those injured by hazardous substances releases.

This RP is developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 43 U.S.C. 9601 *et seq*. (more commonly known as the Federal "Superfund" law), the Department of the Interior's NRDAR regulations at 43 CFR Part 11, and the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §4321 *et seq*.

Summary of NRDAR Settlements

The Trustees recovered monetary damages from many potentially responsible parties (PRPs) in 2003 to 2007 to settle legal claims concerning injuries to natural resources and their services associated with releases of hazardous substances and discharges of oil into the Grand Calumet River in Lake County, Indiana (Trustees 2002). In 2003, the Trustees and LTV Steel Company, Inc. reached a bankruptcy settlement for injuries to natural resources in and around the GCR/IHC site (the LTV CD). In 2005, the Trustees and Atlantic Richfield Company and other entities reached a settlement for injuries to natural resources in and around the GCR/IHC site (the Atlantic Richfield CD). At present, the Trustees intend to use the remaining uncommitted funds from the settlements with LTV Steel Company, Inc. and the Atlantic Richfield Company, *et al*. for the restoration initiatives identified in this RP. Initiatives include augmentation of freshwater mussel populations where they were once found in and around the Great Lakes watershed, as well as associated areas that can produce mussel populations to benefit this watershed and the State of Indiana more broadly.

Public Participation

Public participation and review are an integral part of the restoration planning process. This RP will be open for public comment from January to February 2026, available on IDEM's Public Notices website:

https://www.in.gov/idem/public-notices/ and public notices published in local newspapers.

The Trustees are interested in hearing from individuals, organizations, and agencies concerning these RP efforts. Comments can be shared with the Trustees by writing or emailing:

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This RP will inform the public as to the types and scale of restoration to be undertaken towards compensating for freshwater mussel injuries in the Great Lakes watershed. The Trustees are requesting public comments on the RP and have proposed Preferred Restoration Alternatives in the RP. The Final RP will address comments received if any.

As restoration progresses, the Trustees may amend the Final RP if significant changes are made to the types, scope, or impact of the projects. In the event of a significant modification to the Final RP, the Trustees will provide the public with an opportunity to comment, as appropriate.

Affected Environment and Summary of Injury to Natural Resources

A number of natural resources, including surface water, sediments, fish, freshwater mussels and migratory birds, have been exposed to and adversely affected by oil discharged and hazardous substance releases from facilities in the Lake Michigan Watershed. The Trustees previously (Trustees 1998, 2004) developed a restoration plan to address upland habitats, including globally rare dune and swale protection and management. The Trustees have also participated as a local sponsor with the USEPA on Great Lakes Legacy Act (GLLA) sediment remediation and river restoration projects on 7 reaches of the West Branch Grand Calumet River (WBGCR) and a 2-mile reach of the East Branch Grand Calumet River (EBGCR) from 2009 to 2016. These GLLA restoration efforts consisted of significant planning efforts that included public participation and outreach[1]. This RP builds off these prior restoration initiatives.

For decades, releases of hazardous substances into nearby soils, sediments, and surrounding waters, including tributaries within the Lake Michigan watershed, have led to injury of aquatic life, including freshwater mussels. Freshwater mussel populations in the Lake Michigan watershed have been adversely impacted by degraded water quality events, dredging, dams, urban eutrophication, non-native invasive mussels and sedimentation (Trustees 1997b). Mussels have been indirectly injured due to the absence of fish from the GCR for decades, and more recently because of the delay of the local fish community to recover, resulting in the unavailability of necessary host fish. The mussel assemblage of the Grand Calumet River and Indiana Harbor Canal is dominated by exotic species. No unionid species were observed during any of the biological surveys conducted from 1987 to 2015. The dominant species observed in

[1] Pursuant to § 511(c) of the Clean Water Act [33 U.S.C. 1371(c)], GLLA projects undertaken by the USEPA Administrator are not major federal actions affecting the quality of the human environment under NEPA.

the river include *Corbicula* and *Dreissena* species. These species were collected from both the East and West Branches of the Grand Calumet River. In 1999, the majority of these non-native invasive mussels were recent dead shells and only a few live specimens were observed (Fig. 1).

Fig. 1. In 1999, the Trustees spent a great deal of effort examining the species diversity of benthic invertebrates. Left: an oil-saturated sediment sample from the riverbed. Right: residual shells and very few live specimens of non-native invasive mussels (Corbicula and Dreissena sp.) that remained after washing away sediment.

The Trustees recently concluded that more could be done for freshwater mussels in this area. Here are a few of the milestones that have led to this conclusion. In February 1999, the Trustees collected sediment core samples for chemical and toxicity characterization for our natural resource damage assessment. Near the south bank of the Grand Calumet River near the southwest corner of the Gary Chicago Airport, one sediment core was particularly informative (Fig. 2). Below 10.25' of seriously degraded, industrially generated sediments, the Trustees found relict shells of Wabash Pigtoe (*Fusconaia flava*) and Spike (*Eurynia dilatata*) (Fig. 3). More than 4' of visibly clean, sandy sediments were below where these mussel relicts were found. Depicted below.

Sediment of the WBGCR was sampled in October 2002 (17 transects, 51 cores). At the bottom of at least 8 cores in reach 5 and reach 7 of the WBGCR there were lots of shells of small freshwater bivalve molluscs in the order Sphaeriida (Fig. 4). Burch and Paterson (1976) found 29 species of sphaerid mussels (commonly known as fingernail clams) in the Lake Michigan watershed. The Trustees also collected sediment cores from Roxana Marsh in March 2002. Mussel shell fragments were found below 5' to 7'of seriously degraded, industrially generated sediments. One relict shell fragment from Roxana Marsh belonged to a paper pondshell (*Utterbackia imbecillis*), a common species in the Lake Michigan watershed (Fig. 5).

GLLA remediation and restoration actions implemented by the USEPA and the Trustees have created conditions suitable for some species of mussels returning to the GCR. Table 1 lists the several species attempting to recolonize the capped (remediated) portions of the Grand Calumet River. These positive results have been somewhat surprising since they demonstrate the renewal of the aquatic benthic community from the 100-year buildup of 5' to 10' of toxic sediment.

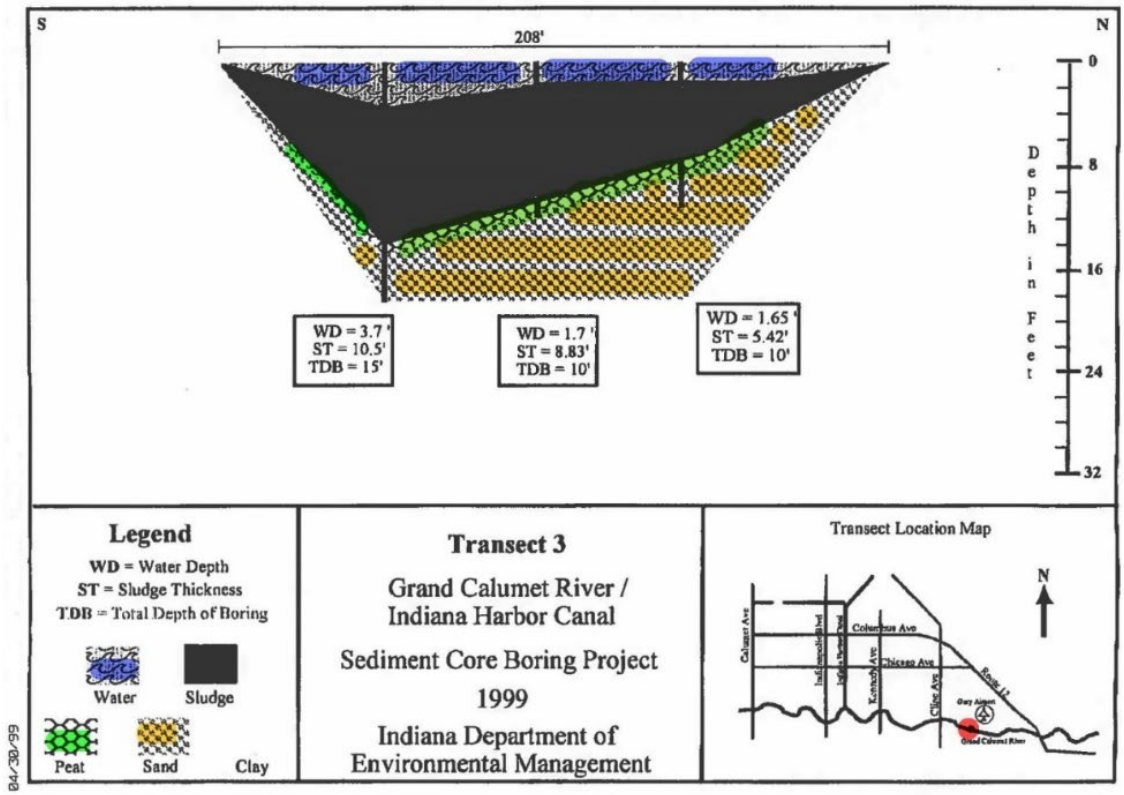

Fig. 2. A sediment coring transect from the Grand Calumet River near the southwest corner of the Gary Chicago Airport in which one sediment core also found remnant mussel shells.

Fig. 3. Relict shells of Wabash pigtoe (Fusconaia flava) and spike (Eurynia dilatata) were found in a Grand Calumet River sediment core (GC99T03L3) near the southwest corner of the Gary Chicago Airport. These shells were found below 10.25' of seriously degraded, industrially generated sediments. More than 4' of visibly clean, sandy sediments were observed below these shells.

Fig. 4. October 2002 West Branch Grand Calumet River sediment coring found lots of shells of small freshwater bivalve molluscs in the order Sphaeriida below 6' of industrially generated sediments.

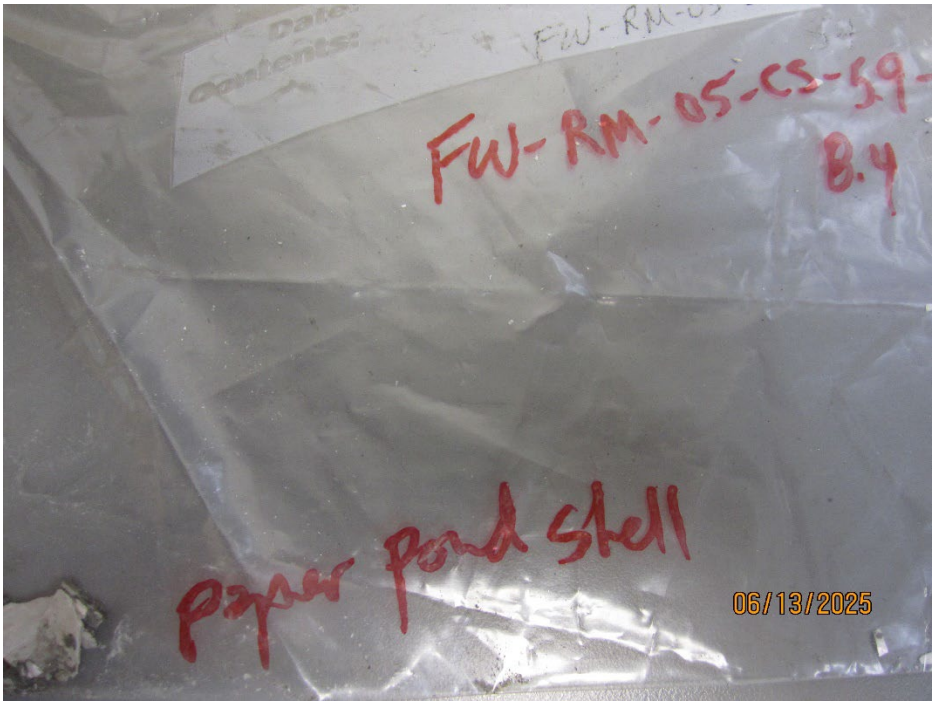

Fig. 5. Paper Pond-shell fragments from Roxana Marsh found below more than 5' of industrially generated sediments.

Despite these positive findings, there are circumstances that still limit mussel recovery. The toxicity of overflows and uncapped areas of the river are still limiting factors. There also appears to be some impairment of mussel reproduction in certain locations possibly due to bioaccumulation of residual contamination. Giant Floaters that were collected for propagation from the West Branch GCR and the Little Calumet River did not contain glochidia despite the

appearance suitable conditions for reproduction. Of the greater than twenty historically present mussel species, the recolonizing species found live were all tolerant species. These species can tolerate greater amounts of sedimentation, lower dissolved oxygen concentrations, and have host fish that can also tolerate degraded conditions. Other species have more stringent ecological requirements that may prevent them from recolonizing without intervention.

For these reasons, the Trustees developed this RP to focus on mussel restoration. This initiative is designed to enhance a long-term effort that addressed historical contamination. The mussel propagation effort widens the net of restoration, affecting not only the area of injury, but creating an opportunity to better the environment in Indiana globally. Restoration of freshwater mussels in the Indiana Great Lakes watershed has already begun under other Great Lake Restoration Initiative efforts. Those efforts will be complemented by the restoration initiatives proposed in this RP.

Common Name	Scientific Name	Status
Chinese Basket Clam	*Corbicula fluminea*	invasive
Fragile Papershell	*Potamilus fragilis*	native
Giant Floater	*Pyganodon grandis*	native
Lilliput	*Toxolasma parvum*	native
Paper Pondshell	*Utterbackia imbecillis*	native
Yangtze Basket Clam	*Corbicula largillierti*	invasive
Zebra Mussel	*Dreissena polymorpha*	invasive

Table 1. Species that have been found live in the Grand Calumet River since the implementation of a sediment cap in portions of the river.

Restoration Goals

The purpose of this RP identifies and evaluates initiatives to restore injured natural resources and services lost due to releases of hazardous substances and discharges of oil into the Lake Michigan watershed associated with the Grand Calumet River. Specifically, the goal of this RP is to improve populations of freshwater mussel species in Indiana's portion of the Great Lakes watershed.

The restoration proposed in this RP will augment the aquatic natural resources that are within the Trustees' current abilities to restore. Indiana's portion of the Lake Michigan watershed historically contained 22 species of freshwater mussels in vast numbers. As many as 47 species of mussels were once present in Lake Erie and its tributaries (Strayer and Jirka 1997, Graf 2002, Krebs et al. 2010).

Although injuries occurred in the GCR, restoration planning to identify mussel augmentation projects at these sites as well as in other areas of the Great Lakes watershed will optimize Trustees' restoration success. The Trustees' capabilities for leading mussel restoration are underdeveloped. Conducting mussel restoration on less sensitive species and in more stable, less contaminated locations will improve compensation for the injury to surface water and biological

resources. This includes efforts to find and procure appropriate broodstock. The proposed and selected alternative in the RP will result in increased populations of mussels that may also result in the ability to supplement reduced priority population areas.

Project Coordination

The Natural Resource Trustees, collectively, will be responsible for overall project coordination and support. The Trustees will work to ensure that the projects meet the NRDAR requirements and fulfill the goals of this restoration plan. The Trustees will be responsible for identification and implementation of the chosen alternative, coordination with all stakeholders, and any other necessary restoration procedures. Approval of restoration initiatives, sites, activities, and fund allocation will be through unanimous agreement by the Natural Resource Trustees via Trustee Council Resolutions.

Proposed Restoration Alternatives

Restoration Alternatives Development and Evaluation

The Trustees considered a reasonable range of restoration alternatives to address one or more specific injuries while making the environment and the public whole were considered, including natural recovery (no action). For each alternative, considerations were given to costs, benefits, likelihood of success, and effects on public health and safety. In the formulation of restoration options, the Trustees considered restoration for augmenting common mussel species, mussel species of concern, Indiana listed species and federally listed species. Starting out, the Trustees have chosen to emphasize working opportunistically on species and projects that show promise for increasing mussel numbers and species diversity as we build capacity and improve our abilities.

Alternative C of the RCDP for the GCR NRDAR described in detail "Replace/Acquire Equivalent Resources (Replacement Restoration)" approach to restoration. "For example, injury to the surface water resources of the GCR/IHC could be compensated by water quality improvements in a similar waterway" (p. 33 of the RCDP). Restoring mussel populations replace not only mussels lost in the GCR, but replacement mussels also will improve water quality where their populations are enhanced.

Criteria for Identifying and Evaluating Restoration Alternatives

Drawing upon the factors within the Department of the Interior NRDAR regulations at 43 CFR 11.81— 84 and 11.93, and Department of the Interior policy for selecting a restoration alternative, the Trustees select a preferred restoration alternative based on all relevant considerations including, but not limited to, general consideration of the following factors:

- closeness of nexus between the restoration activity and the injuries;
- degree to which restoration activity will directly benefit injured resources;

- technical feasibility;
- relationship of the expected costs of the proposed actions to the expected benefits from the restoration action, including amount of desirable functions restored and ecological benefit to the surrounding watershed;
- cost-effectiveness;
- potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other resources;
- 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 and State policies; and,
- compliance with applicable Federal and State laws.

The preferred restoration alternative described herein is based on conceptual plans for which some costs have been estimated. The size and design of the recommended restoration actions may change based on additional public input and/or additional scientific findings. If, during implementation, the Trustees determine the need for significant changes to the selected restoration alternative, additional public review and comment will be sought as appropriate. The Trustees will not conduct any restoration activities that would incur ongoing expenses in excess of those the settlement monies and associated interest can fund, unless such additional monies are allocated through the normal budget process.

In addition to the required criteria, the following criteria were also used to select the appropriate restoration alternatives:

- Indiana listing status
- the urgency to take actions for declining populations to address injuries
- challenges of working with the species
- hatchery experience with the species
- difficulty of collecting broodstock, and
- current presence of known host fish near current/historic mussel records for considered species.

Alternative 1: No Action Alternative (no mussel augmentation efforts)

Due to current site conditions, native populations of many of these species may not recover in Lake Michigan tributaries without intervention. Modifications to the Grand Calumet River have not been completely remediated and restored, leaving much of the river still unsuitable. Spills continue in the watershed infrequently but do have an adverse impact on water quality, aquatic fish and wildlife. It is not feasible to locate and monitor remnant populations nor to expect full natural recovery of mussel species diversity.

Alternative 2: Freshwater Mussel Augmentation Only in the Grand Calumet River

The previously described site conditions are expected to decrease the likelihood of success for natural recovery and interfere with efforts to assist freshwater mussel recovery in some areas of the GCR. Lack of a sediment cap of sufficient depth make mussel augmentation efforts in some of the GCR technically infeasible at present. Water quality conditions at these locations increase the difficulty and costs of stocking and monitoring mussel populations in some areas. U.S. Geological Survey stream gauge data near these locations show annual average water depths of seven to ten feet. Such conditions limit monitoring to periods of low water, which can be of short duration and not always predictable or require scuba divers to conduct monitoring in areas that are not yet safe for such activity. Comprehensive monitoring efforts in the Great Lakes watershed beyond the GCR may be a source of broodstock that would offer a starting point for GCR mussel augmentation efforts. Given the unfinished remedial action needs in the GCR chances of success are limited.

Alternative 3: Freshwater Mussel Augmentation in Indiana's Great Lakes watershed (Selected)

Alternative 3, the preferred alternative proposes restoration initiatives for augmentation of freshwater mussel populations in the Great Lakes watershed, and other areas outside the watershed that can produce mussels to benefit this watershed and the State of Indiana more broadly. Specifically, under this Alternative, the Trustees propose to augment populations of many mussel species to the extent possible as tools and abilities are developed in partnership with malacological experts. Mussel restoration work is having some success in the East Branch Little Calumet River (EBLCR). This RP could support existing EBLCR efforts as they augment several different species of mussels [White Heelsplitter (*Lasmigona complanata*), Fatmucket (*Lampsilis siliquoidea*), Spike (*Eurynia dilatata*), Creeper (*Strophitus undulatus*), Cylindrical Papershell (*Anodontoides ferussacianus*), Plain Pocketbook (*Lampsilis cardium*), Giant Floater (*Pyganodon grandis*), Ellipse (*Venustaconcha ellipsiformis*), Rainbow (*Cambarunio iris*), Threeridge (*Amblema plicata*), Wabash Pigtoe (*Fusconaia flava*), Creek Heelsplitter (Lasmigona compressa), Flutedshell (*Lasmigona costata*), Round Pigtoe (*Pleurobema sintoxia*), Pimpleback (*Cyclonaias pustulosa*), Mapleleaf (*Quadrula quadrula*), Slippershell Mussel (*Alasmidonta viridis*), Fragile Papershell (*Potamilus fragilis*), Paper Pondshell (*Utterbackia imbecillis*)]. In addition, monitoring in the Great Lakes watershed beyond the Calumet Rivers will likely be a source of broodstock that would offer a starting point for additional augmentation efforts with additional species. Developing additional mussel augmentation efforts in proximity to known or potential sources of broodstock would enhance our chances of success.

Augmentation of several mussel species is considered within this alternative, including those mentioned above, plus: Pink Heelsplitter (*Potamilus alatus*), Lilliput (*Toxolasma parvum*), Rayed Bean (*Villosa fabalis*), Kidneyshell (*Ptychobranchus fasciolaris*), Sheepnose (*Plethobasus cyphyus*), Fanshell (*Cyprogenia stegaria*), Round Hickorynut (*Obovaria subrotunda*), and Snuffbox (*Epioblasma triquetra*).

The Trustees will prioritize restoration actions based on several factors including, but not limited to: opportunity, existing knowledge, likelihood of success and conservation status. We will explore opportunities for cooperation with other malacological experts and develop species specific projects as knowledge and opportunities allow. The Trustees will select restoration which will have the greatest potential to restore mussel resources to their recovery potential levels. The selected restoration initiatives will result in habitat improvement and enhancement of rare and endangered mussel population recruitment. The time frame needed for injured resources to recover to their pre-spill levels is unknown but is suspected to be several to many years.

Summary of Environmental Consequences by Alternative

In this section, the Trustees analyzed the environmental consequences of Alternatives 1, 2, and 3 to determine whether implementation of any of these alternatives may significantly affect the quality of the human environment, particularly with respect to the physical, biological, socio-economic, or cultural environments. This section also identifies the Selected Alternative.

Alternative 1: No Action Alternative (no mussel augmentation efforts)

Under this Alternative, the Trustees would not initiate specific actions to restore injured natural resources and their services to baseline conditions or compensate the environment and the public for natural resource injuries caused by the releases of hazardous substances and discharges of oil into the environment.

Under this Alternative, the state and federal agencies and landowners would continue to manage, conserve and protect the sites within the Great Lakes Watershed as outlined in current programs and regulations and within applicable budget constraints. However, no additional action would be taken to compensate for injuries to natural resources or their services.

The goal of this restoration plan is to address the resource injuries resulting from releases of hazardous substances and discharges of oil within the the Great Lakes watershed. This alternative does not allow for restoration, replacement or acquisition of equivalent resources injured from spills. Without restoration, compensation for injury to natural resources would not occur. All species of mussels will likely struggle to recover and continue to decline. Specifically, under this alternative, no mussel augmentation efforts would occur thereby foregoing a critical component of aquatic ecosystem recovery. As such, water quality would not be improved, sediments would not be stabilized, and biodiversity would not be enhanced.

Alternative 2: Freshwater Mussel Augmentation Only in the Grand Calumet River

The environmental consequences of implementing a freshwater mussel augmentation effort only in the Grand Calumet River would have limited opportunities, with delayed ability to document restoration progress. Embarking on mussel augmentation efforts will be challenging as we work around spills and releases. Success with culturing young mussels from gravid females (a precursor to augmenting in-stream populations) could potentially benefit management of these rare species. However, these gains in juvenile mussels may not be given a maximum chance at survival and reproduction due to the degree of difficulty working in the Grand Calumet River as it currently exists.

Alternative 3: Freshwater Mussel Augmentation in Indiana's Great Lakes watershed (Selected)

The environmental consequences of implementing a freshwater mussel augmentation efforts in the Great Lakes watershed and other related areas provide the greatest chances of successful augmentation efforts. Further, additional mussel augmentation efforts will be attempted in select areas with the highest chances of success. Initiating mussel augmentation efforts with partners to develop successful culturing techniques will greatly benefit species and ecosystem recovery. Augmenting populations of these mussels in the Indiana Great Lakes watershed will add to water quality improvements.

Environmental Compliance

Actions undertaken by a federal trustee to restore natural resources or services under CERCLA are subject to the NEPA (42 U.S.C. § 4321 et seq.) and other federal laws. This plan meets the criteria for a categorical exclusion from a NEPA analysis under the Department of the Interior's Departmental Manual chapter on managing the NEPA Process for the U.S. Fish and Wildlife Service, 516 DM 8.5 (B)(6) and (11). A categorical exclusion from the National Environmental Protection Act (NEPA) procedures is provided for actions implemented by the USFWS for:

> the reintroduction or supplementation (e.g., stocking) of native, formerly native, or established species into suitable habitat within their historic or established range, where no or negligible environmental disturbances are anticipated [516 DM 8.5 (B)(6)]; and
>
> Natural resource damage assessment restoration plans, prepared under sections 107, 111, and 122(j) of CERCLA; section 311(f)(4) of the Clean Water Act; and the Oil Pollution Act; when only minor or negligible change in the use of the affected areas is planned [516 DM 8.5 (B)(11)].

The completed Environmental Action Statement is included at the end of this RP. Any additional environmental compliance required, including compliance with Endangered Species Act consultation and National Historic Preservation Act, as appropriate, will occur prior to implementation of restoration.

Monitoring

The monitoring of this restoration plan will be conducted by the Natural Resource Trustees or their designated representatives. After a sufficient period of growing out juvenile mussels, an effort to tag mussels for monitoring is important. This involves using adhesives and pit tags. Monitoring mussel augmentation sites should take place annually after river placement. Monitoring efforts will document the success of our efforts.

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