Revised Draft Programmatic Environmental Assessment

Levee Flood Mitigation Projects

Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin

March 2025

FEMA

Federal Emergency Management Agency
Region 5
Department of Homeland Security
536 South Clark Street, Sixth Floor
Chicago, IL 60605

This page intentionally left blank.

Table of Contents

Appendices

Figures

Tables

Acronyms and Abbreviations

°F	degrees Fahrenheit
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
BFE	Base Flood Elevation
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
CAA	Clean Air Act
CATEX	Categorically Excluded
CBRS	Coastal Barrier Resources System
CELCP	Coastal and Estuarine Land Conservation Program
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
DNL	day–night averaged sound level
DNR	Department of Natural Resources
EA	Environmental Assessment
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act
FRA	Federal Railroad Administration
GIS	Geographic Information System
GLRI	Great Lakes Restoration Initiative
GLWQA	Great Lakes Water Quality Agreement
HMA	Hazard Mitigation Assistance
IDEM	Indiana Department of Environmental Management
IDOT	Illinois Department of Transportation
IEPA	Illinois Environmental Protection Agency
INDOT	Indiana Department of Transportation
Ldn	day–night averaged sound level
MBTA	Migratory Bird Treaty Act
MDOT	Michigan Department of Transportation
MnDOT	Minnesota Department of Transportation
NAAQS	National Ambient Air Quality Standards

NEPA	National Environmental Policy Act
NFIA	National Flood Insurance Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NHRP	National Register of Historic Places
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	notice of intent
NPDES	National Pollutant Discharge Elimination System
NRCS	U.S. Natural Resources Conservation Service
NREPA	Natural Resources and Environmental Protection Act
O_3	ozone
ODOT	Ohio Department of Transportation
OHWM	Ordinary High Water Mark
PA	Public Assistance
Pb	Lead
PCB	polychlorinated biphenyls
PEA	Programmatic Environmental Assessment
PM	Particulate Matter
RCRA	Resource Conservation and Recovery Act
Reserve System	National Estuarine Research Reserve System
SEA	Supplemental Environmental Assessment
SFHA	Special flood hazard area
SHPO	Stormwater Pollution Prevention Plan
SO_2	sulfur dioxide
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Loads
USACE	United States Army Corps of Engineers
U.S.C	United States Code
USDA	U.S. Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
WDNR	Wisconsin Department of Natural Resources
WisDOT	Wisconsin Department of Transportation

SECTION 1. Introduction

The Federal Emergency Management Agency's (FEMA) mission is to serve the United States before, during, and after disasters while instilling the core values of compassion, fairness, integrity, and respect. FEMA programs strive to reduce the loss of life and property, and to protect institutions from all hazards by leading and supporting the nation in a comprehensive, risk-based, emergency management program of mitigation, preparedness, response, and recovery. An important component of FEMA's mission is disaster resilience, which includes funding for activities that help communities reduce the future impacts of natural disasters on life and property.

Flood control projects may be funded under FEMA's Hazard Mitigation Assistance (HMA) programs, authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, 42 United States Code (U.S.C.) §§ 5121–5207. HMA offers multiple funding programs, including the Hazard Mitigation Grant Program, the Flood Mitigation Assistance Program, the Pre-Disaster Mitigation Program, and the Building Resilient Infrastructure and Communities Program. Flood control projects eligible for HMA funding must meet the individual program requirements as set forth by FEMA. The *HMA Program and Policy Guide* provides descriptions of the requirements for hazard mitigation activities (FEMA 2023a). See Section 9 for references listed by author or agency and year of publication.

Funding also may be requested from FEMA's Public Assistance (PA) Program for emergency protective measures and debris removal (emergency work) and for permanent restoration of damaged facilities, including cost-effective hazard mitigation to protect the facilities from future damage. To receive PA funding, the proposed work must be an eligible activity, required as a result of a declared incident, within the designated area, and proposed by a legal applicant. PA-funded actions are generally statutorily excluded from National Environmental Policy Act (NEPA) review because they are actions taken to provide assistance under Sections 402 (General Federal Assistance), 403 (Essential Assistance), 407 (Debris Removal), or 502 (Federal Emergency Assistance) of the Stafford Act, as well as actions taken or assistance provided under the Stafford Act that has the effect of restoring facilities as they existed before a major disaster or emergency (FEMA 2024a). Flood control projects would not be eligible under the PA Program unless the current flood control is a threat to life, public health, or safety, or unless the proposed work receives Section 406 mitigation funding related to an eligible disaster-damaged facility (FEMA 2020) or receives FEMA approval to proceed with an alternate or improved project.

The purpose of this Programmatic Environmental Assessment (PEA) is to identify, at a programmatic level, the potential adverse and beneficial effects associated with certain flood control projects within the states of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin; these states comprise FEMA Region 5. This PEA captures and builds upon FEMA's knowledge and experience—via prior environmental planning and historic preservation reviews—to evaluate the potential effects of FEMA funding for eligible flood control projects. The PEA also identifies specific flood control projects that may not require additional NEPA review, as well as those actions that would require site-specific reviews and that could be tiered under this PEA. Some projects or classes of activities may continue

to require full project-specific NEPA compliance reviews. Users of this PEA should note that FEMA grant programs are subject to change and this PEA would potentially cover changes in eligibility and programs.

FEMA prepared this PEA in accordance with NEPA, the Council on Environmental Quality (CEQ) regulations to implement NEPA (40 Code of Federal Regulations [C.F.R.] Parts 1500–1508), and agency guidance for implementing NEPA (Department of Homeland Security Instruction 023-01-001 and FEMA Instruction 108-1-1). FEMA is required to consider potential environmental impacts on the human and natural environment before funding or approving actions and projects.

In addition, FEMA has prepared a Principles, Requirements, and Guidelines (PR&G) for Federal Investments in Water Resources analysis, which is included in Appendix A and incorporated into this document. The PR&G analysis applies to federal investments that—by purpose, directly or indirectly—alter water resources by affecting water quality or quantity and have at least $10 million in project costs. The PR&G analysis provides a framework for federal agencies to evaluate proposed water resources projects while considering economic, social, and environmental objectives. The PR&G analysis follows FEMA-specific procedures, as described in FEMA Instruction 108-1-1.

1.1. Flood Control Measures

High-precipitation events and peak stream flows can lead to inland flooding causing damage to infrastructure. Historical land use and development have resulted in modified streams and floodplains and increased area of impermeable surface that contribute to flood risks. Flood control measures are intended to reduce flood loss and damage to facilities and structures. Measures include construction of earthen levees and floodwalls along streams, channels, and other waterway banks, as well as around facilities and structures. These measures are designed to provide flood protection and are intended to be subjected to temporary flood loads.

Floods can negatively affect communities in numerous ways through the disruption of services from facilities such as water/wastewater treatment plants, closure of businesses, and damage to homes that could cause residential displacement. Benefits of flood control measures include flood risk reduction on facilities and structures. These measures prevent flood waters from entering developed areas and would allow additional time for evacuation of individuals within a leveed area should a flood event exceed the design event for a flood control measure. In addition to providing flood risk reduction for a community, flood control projects may also serve as sites for habitat corridors, recreation parks, and other public amenities.

Flood control projects may include some repair to pre-disaster conditions where current flood levees have been damaged. Normally, repair work would be statutorily excluded from NEPA review if done on its own. However, if repair work is completed as part of a mitigation project, it would be considered a connected action to the mitigation action and would require further NEPA review to determine whether it is eligible for coverage under this PEA.

1.2. Background

Precipitation and storm events have become more frequent and intense in the past 30 to 40 years, increasing stream flows, storm surge, and incidents of flooding, and impacting lives, property, and infrastructure in the Midwest. Annual precipitation has increased 5 percent to 15 percent from the first half of the last century (1901 to 1960) compared to the present day (1986 to 2015). Winter and spring precipitation is projected to increase by up to 30 percent by the end of this century. Heavy precipitation events have increased in frequency and intensity since 1901 and are projected to increase throughout this century (Easterling et al. 2017). As a result, annual average streamflow has increased in the Midwest. From 1940 to 2018, 7-day low-stream flows have generally increased, which means that on the days of the lowest flows, streams are carrying more water than recorded in the past. With increased precipitation, higher than average streamflow is expected in some places, with heavier storms leading to larger peak flows. Larger peak flows can lead to overtopping of streambanks, causing flooding (U.S. Environmental Protection Agency [EPA] 2023a).

Heavy rainstorms can result in the temporary closure of roadways because of riverine flooding, and faster stream flows caused by increased precipitation can erode the bases of bridges or road embankments resulting in long-term closures (Angel et al. 2018). Other impacts on infrastructure from stream flooding include damage to utilities such as power, water, sewer, and gas, as well as overflow and damage of stormwater management systems. Changes in precipitation accounted for 36 percent of the actual flooding costs that occurred in the United States from 1988 to 2017 (Davenport et al. 2021). There has been a recent increased risk of inland flooding in the Midwest region, which subsequently will result in increased damage and costs (National Oceanic and Atmospheric Administration [NOAA] 2019). The increase in flooding occurrences and magnitude throughout the region has increased the risk to the area's critical infrastructure such as water/wastewater treatment plants. Damage and disruption in these services are detrimental to communities, creating public health issues. Over the past decade, Region 5 has recorded multiple major disaster declarations for severe storms and flooding that have triggered recovery and mitigation actions (FEMA 2023b).

1.3. Study Area

The area of analysis for this PEA encompasses flood control projects within Region 5 (i.e., the states of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin) and earthen berms and floodwalls along waterbodies and around facilities and structures. Earthen berms and floodwalls covered by the PEA would be limited to no more than 1 mile in length, including the length of levees around infrastructure, and no more than 10 acres of ground disturbance. For this PEA, streams are defined as any flowing waterway and tributaries regulated by the U.S. Army Corps of Engineers (USACE), including streams, creeks, rivers, and brooks and channels that empty into the regulated waterways. Work along the Mississippi River and Ohio River is not eligible for NEPA coverage under this PEA and would require a separate NEPA review. Further, the area of analysis for this PEA excludes designated rivers protected under the Wild and Scenic Rivers Act; projects near such rivers would require the preparation of a stand-alone EA.

To limit the extent of the study area, this PEA only covers projects with the primary purpose of addressing flood control. The projects covered by this PEA include levees and floodwalls along waterbodies and around facilities and structures. These project types, in certain cases, would also have flood reduction benefits. FEMA assistance is generally limited to nonfederal and tribal lands in areas eligible for funding under FEMA's HMA and PA programs.

1.4. Process for Using Programmatic Environmental Assessment

CEQ regulations 40 C.F.R. §§ 1500.4(k) and 1501.11 encourage the development of program-level NEPA environmental documents and tiering from those programmatic documents to eliminate repetitive discussions and allow for site-specific reviews focused on a narrower scope specific to the subsequent action. A PEA addresses a group of projects that are similar in scope, scale, magnitude, and nature of impact. In addition, CEQ regulations 40 C.F.R. § 1501.5 allow agencies to prepare an environmental assessment (EA) on any action at any time to assist agency planning and decision-making. FEMA developed this PEA under these CEQ authorities. Consistent with the 2023 Fiscal Responsibility Act's revisions to NEPA, if actions that may fall within the scope of this PEA are considered beyond the 5-year anniversary of the final PEA, then the PEA's analysis and underlying assumptions must be reevaluated to ensure they are still valid for the actions under review (Public Law 118-5).

For a project to qualify under this PEA, the scope of the project and the nature of impact must be evaluated within this PEA. A finding that the project conforms to the PEA must be documented using a Record of Environmental Consideration. Additional project-specific analyses may be required if the context and intensity of a proposed project substantively differ from those described in this PEA. All projects using this PEA must undergo standard compliance procedures regarding other federal laws (e.g., Endangered Species Act [ESA], National Historic Preservation Act, Executive Orders [EOs] for Floodplain Management, and Protection of Wetlands).

Some flood control projects are expected to be more complicated and involve larger-scale efforts than those contemplated in this PEA. If a specific action is expected to (1) create impacts not described in this PEA, (2) create impacts greater in magnitude, extent, or duration than those described in this PEA, or (3) require mitigation measures that are not described in this PEA to keep impacts below significant levels, then a supplemental environmental assessment (SEA) would be prepared to address the specific action. The SEA would be tiered from this PEA in accordance with CEQ's NEPA-implementing regulations. Actions that require a more detailed or broader environmental review may warrant the preparation of a stand-alone EA or other applicable NEPA process. Flood control projects that involve levees are not eligible for categorical exclusions (FEMA Instruction 108-1-1).

This PEA is intended to facilitate FEMA's compliance with environmental and historic preservation requirements by providing a framework to address the potential impacts of flood control projects. FEMA coordinates and integrates—to the maximum extent possible—the review and compliance processes required by other federal laws and policies, such as Section 106 of the National Historic Preservation Act (NHPA), Section 7 of the ESA, the 8-Step Decision-Making Process of EOs 11988

(for Floodplain Management) and 11990 (for Protection of Wetlands), and others. This PEA provides a framework for integrating these requirements with NEPA compliance for flood control projects.

This PEA does not cover actions where there are likely to be significant effects and for which it would be appropriate to develop an environmental impact statement. CEQ regulations (40 C.F.R. § 1501.3) provide guidance to determine whether the effects of an action could be significant, including the following:

- To determine whether the effects of the Action Alternative are significant, agencies will analyze the potentially affected environment and the degree of the effects of the action. Agencies should consider connected actions consistent with 40 C.F.R. § 1501.9(e)(1).

- When reviewing the potentially affected environment, agencies should consider, as appropriate to the specific action, the affected area (e.g., national, regional, or local) and its resources, such as listed species and designated critical habitat under ESA or historic properties that would require review under the NHPA. Significance varies with the setting of the Action Alternative. For instance, in the case of a site-specific action, the significance would usually depend only upon the effects within the local area (40 C.F.R. § 1501.3[b][1]).

- In considering the degree of the effects, agencies should consider the following, as appropriate to the specific action (40 C.F.R. § 1501.3[b][2]):

    - Short- and long-term effects

    - Beneficial and adverse effects

    - Public health and safety effects

    - Effects that would violate federal, state, tribal, or local laws protecting the environment.

SECTION 2. Purpose and Need

The purpose of mitigation funding in FEMA's HMA and PA grant programs is to promote disaster resilience by providing assistance to state, local, tribal, and territorial governments for projects that help prevent loss of life and property and reduce disaster recovery costs. Uniform and efficient provision of assistance is an essential goal of the HMA and PA programs. The purpose of flood control projects is to reduce risks associated with flood hazards that affect people, structures, and infrastructure. These projects are needed because of repetitive and increased levels of flooding resulting from the increasing frequency and intensity of storms, storm surge, and stream flows, as discussed in Section 1.2.

SECTION 3. Alternatives

This section describes the alternatives evaluated in the PEA—the No Action alternative and the Proposed Action.

3.1. Alternative 1 – No Action

Under the No Action alternative, FEMA would not undertake or fund any flood control action involving levees and floodwalls not covered under Categorical Exclusion N9, *Federal Assistance for Flood Hazard Reduction Actions* (FEMA Instruction 108-1-1). There could be a range of possible outcomes if FEMA does not provide funding, depending on the amount of alternative funding available and priorities established by a community. Because there is a broad range in the size and capabilities of communities along streambanks within Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, it is impossible to predict each community's actions, time frame, and standards by which work would be completed. Therefore, to provide a consistent basis for comparison to the Proposed Action, it is assumed, for the purposes of this PEA, that facilities would remain in their current state (e.g., damaged facilities would not be repaired or replaced and hazardous conditions would not be mitigated) or local and state governments and private property owners might construct some non-FEMA-funded minor projects that could include repairs, minor mitigation, and flood control projects. These projects would be properly engineered and permitted but may not provide the same level of protection as the Proposed Action and would not necessarily be connected or constructed in a coordinated fashion to provide protection across property boundaries or jurisdictional lines. Because of the time needed to gather enough funding for construction, specific actions may take longer to implement under the No Action alternative. The project area would still be subject to flooding for the planning horizon of the PEA because of the unmitigated effects of storm and flood events. The No Action alternative would not result in long-term resilience or coordinated hazard mitigation.

3.2. Alternative 2 – Proposed Action

The Proposed Action includes flood control projects that are eligible for FEMA funding. Flood control projects would include levees and floodwalls along streambanks and around facilities and structures. Projects covered under the PEA would be limited to no more than 1 mile of levee or floodwall length, including levees and floodwalls surrounding facilities, and no more than 10 acres of ground disturbance. Projects that exceed these limits would require a separate evaluation. FEMA will review each project to determine whether coverage by this PEA or another level of evaluation would be more suitable, such as a SEA, a project-specific EA, or an environmental impact statement. The following subsections describe the project types and activities associated with flood control covered under this PEA.

3.2.1. Common Scope of Work

Earthen levees and floodwalls would entail many of the same activities or scope of work, and both would involve flood control work to address issues related to flooding, including reducing the frequency of flooding to a portion of the floodplain or keeping floodwaters out of an enclosed area. Flood control work may take place where current flood levees have been damaged, in areas where no damage has occurred but improvements are needed to mitigate future flood damage, or in areas where there are currently no levees. All projects would be designed by a hydraulic engineer to ensure proper sizing of materials and placement. A hydrologic and hydraulic study would be conducted to confirm no adverse effect on the Base Flood Elevation up or downstream. Construction activities that may be associated with either action include:

- Demolition or modification of existing facility or structure
- Tree and vegetation cutting, clearing, and removal
- Excavation in upland and embankment areas
- Grading
- Creation and use of staging areas and site access routes
- Installation of erosion and sediment control measures
- Placement of fill materials such as riprap into stream channels
- Dewatering and temporary stream diversion
- Traffic disruptions, lane closures, and possible detours for projects adjacent to or crossing roadways
- Site restoration and stabilization

3.2.2. Earthen Levees

This action encompasses the construction of earthen levees along waterbodies such as streams and rivers and around facilities and structures. A levee is an embankment designed to provide flood protection and is only subject to water loading for short periods of time during a year. Based on this project type, levees are broadly classified as either urban or agricultural levees. Designs for earthen levees would follow guidelines provided in the USACE *Design and Construction of Levees* (USACE 2000).

Earthen levees typically comprise a foundation and an embankment. To maintain the integrity of a levee, additional supporting features may be included in the design to address erosion protection, seepage control, drainage, and stability. Erosion protection would be placed on the waterside of the levee and often consists of riprap. Seepage and drainage control systems may include piping and

pump stations, as well as berms on the landside of the levee. The central core portion of the embankment also may be constructed with a less pervious soil type to address potential seepage issues (Figure 3-1).

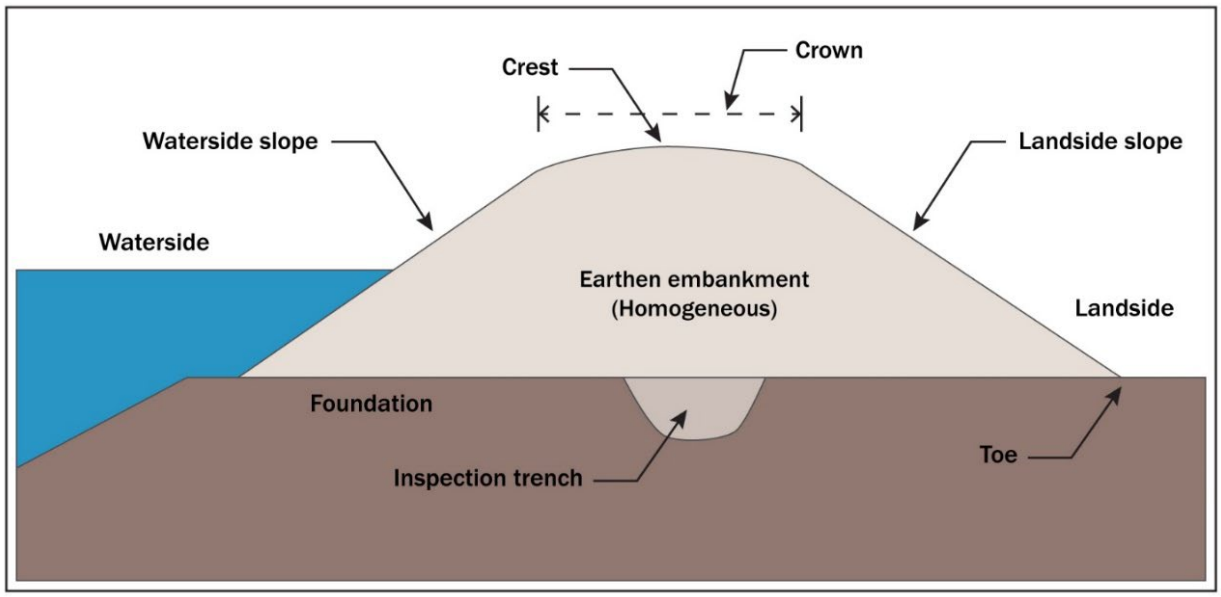

Figure 3-1. Typical Earthen Embankment

Soil and rock used to construct an earthen levee would be obtained from borrow areas, dredged areas, or off-site commercial fill. The levee materials would be piled using mechanical equipment and may be compacted, semi-compacted, or uncompacted. Except for very wet, fine-grained soils or highly organic soils, almost any soil type would be suitable for constructing earthen levees. Accessibility and proximity are often the controlling factors in selecting borrow areas for obtaining fill. Generally, borrow areas are established parallel and adjacent to the levee to make the construction process more efficient. However, because of space limitations, construction of urban levees may require borrow areas further from the levee alignment. Borrow areas on the river side of the levee are preferred because river borrow locations would be filled eventually by siltation. Waterside borrow areas are also preferred to be wide and shallow as opposed to narrow and deep because this aids in the natural filling by siltation. Impervious cover would be left over underlying pervious material in borrow areas to ensure further loss of exposed material left over. Topsoil from borrow and levee foundation stripping can be stockpiled and spread over the excavated area after borrow excavation has been completed.

Foundation preparation for levees would consist of clearing and grubbing all unsuitable material such as trees and vegetation. Stripping is also often required to remove low-growing vegetation and organic topsoil, normally up to 1 foot deep. An exploration trench would then be excavated at or near the centerline of the levee. Dimensions of the trench would vary with soil conditions and embankment configurations; however, the trench would have a minimum depth of 6 feet, except in cases where the embankment height would be less than 6 feet, in which case the minimum depth

would equal the embankment height. Depending on site conditions, the foundation may or may not be over-excavated to provide a solid foundation.

Embankment geometry would vary depending on site conditions and the type of construction. The minimum levee section would have a crown width of at least 10 feet and a side slope flatter than or equal to 2 horizontal units to 1 vertical unit. While grass cover is commonly planted on embankment slopes, the waterside slope may need additional protection against the erosional forces of waves and stream currents. Riprap is commonly used to provide this greater protection. Levees around facilities and structures would remain within the footprint of the facility or structure's property.

3.2.3. Floodwalls

This action encompasses the construction of floodwalls along waterbodies such as streams, rivers, and lakes (including the Great Lakes), and around facilities and structures. A floodwall is a wall built with human-made materials, such as concrete or steel, designed to provide flood protection and subjected to temporary flood loads. Floodwalls are typically on existing grades but may also be on top of earthen levees. Floodwalls would follow guidelines provided in USACE's *Engineer Manual for Floodwalls and Other Hydraulic Retaining Walls* (USACE 2022). Floodwalls around facilities and structures would remain within the footprint of the facility's or structure's property.

Common types of floodwalls include concrete walls with shallow foundations (**Figure 3-2**), concrete walls with deep foundations (**Figure 3-3**), and cantilever pile walls (**Figure 3-4**, **Figure 3-5**, and **Figure 3-6**). Following are descriptions of each floodwall type.

Floodwalls with concrete walls and shallow foundations are supported by underlying soil or rock. The bottom of the base would be below the zone subject to freezing. This floodwall type includes cast-in-place reinforced concrete cantilever walls and mass concrete gravity walls. A cast-in-place cantilever T-type or L-type reinforced concrete wall would consist of a concrete stem and base slab that form an inverted T or an L (**Figure 3-2**). A mass concrete gravity wall would consist of concrete that is designed without steel reinforcement.

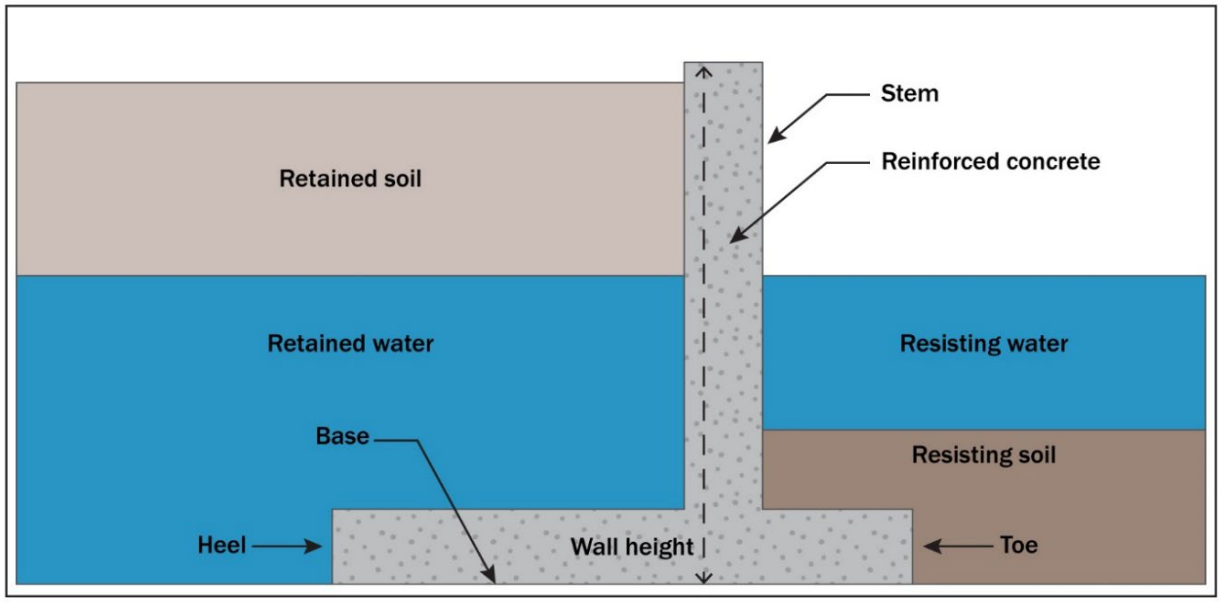

Figure 3-2. Concrete Wall with Shallow Foundation Example

Floodwalls with concrete walls and deep foundations are similar to those with concrete walls and shallow foundations but are used when the minimum design requirements cannot be achieved with a shallow-founded wall. Issues that may require concrete floodwalls with deep foundations include bearing capacity (i.e., soil capacity to support loads applied to the ground), resultant location of forces applied to the ground, sliding, or foundation settlement. These floodwall types are also supported by driven piles or drilled shafts within the underlying soils. Piles can be vertical, battered, or a combination of both. As with concrete walls with shallow foundations, deep foundation concrete walls include cast-in-place reinforced concrete cantilever walls and mass concrete gravity walls (Figure 3-3).

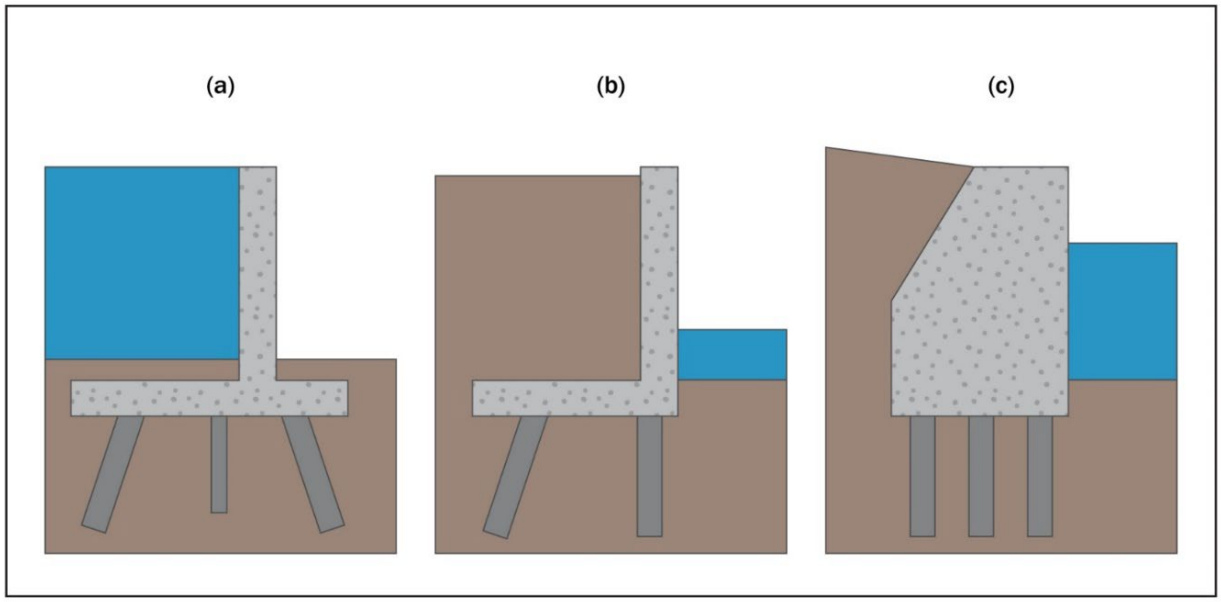

Figure 3-3. Concrete Wall with Deep Foundation Examples

Floodwalls with cantilever pile walls consist of non-gravity systems without a base foundation or pile cap. The main wall elements are vertical and act as beams for transmitting horizontal loads. This floodwall type includes continuous cantilever pile walls (**Figure 3-4**), combined wall systems (**Figure 3-5**), and discrete cantilever pile walls (**Figure 3-6**). In a continuous cantilever pile wall (commonly known as an I-wall), each of the vertical elements in a wall segment would have the same section and sheet pile type. Driven sheet piles are most commonly used and their height is normally less than 10 feet. Combined wall systems consist of two primary components, regularly spaced structural piles (king piles) and the intermediary sheet piles. Combined wall systems are typically used when regular sheet piles are not strong enough to carry the required loads. Discrete cantilever pile walls, known also as post-and-panel wall or soldier pile wall, have individual piles installed at a regular spacing with structural panels used to span between the panels.

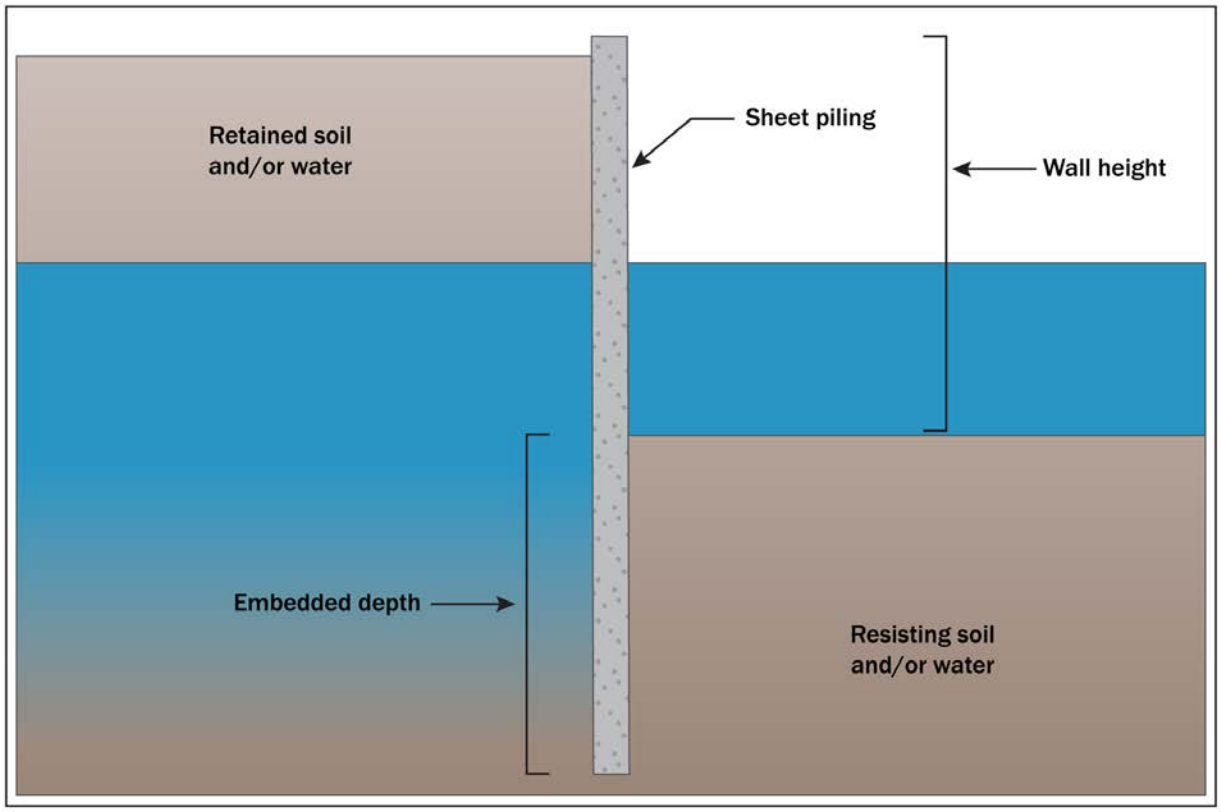

Figure 3-4. Continuous Cantilever Pile Wall Example

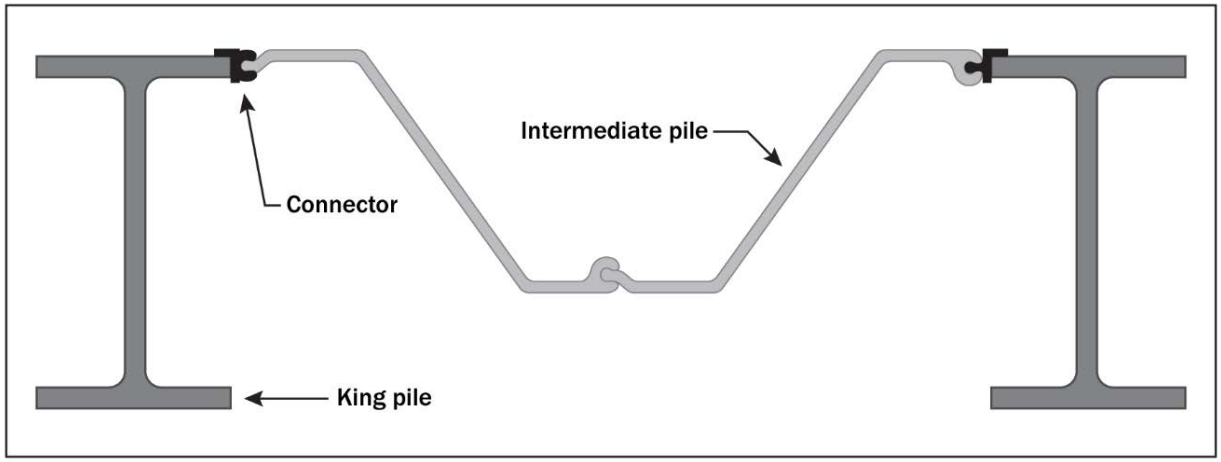

Figure 3-5. Combined Wall System

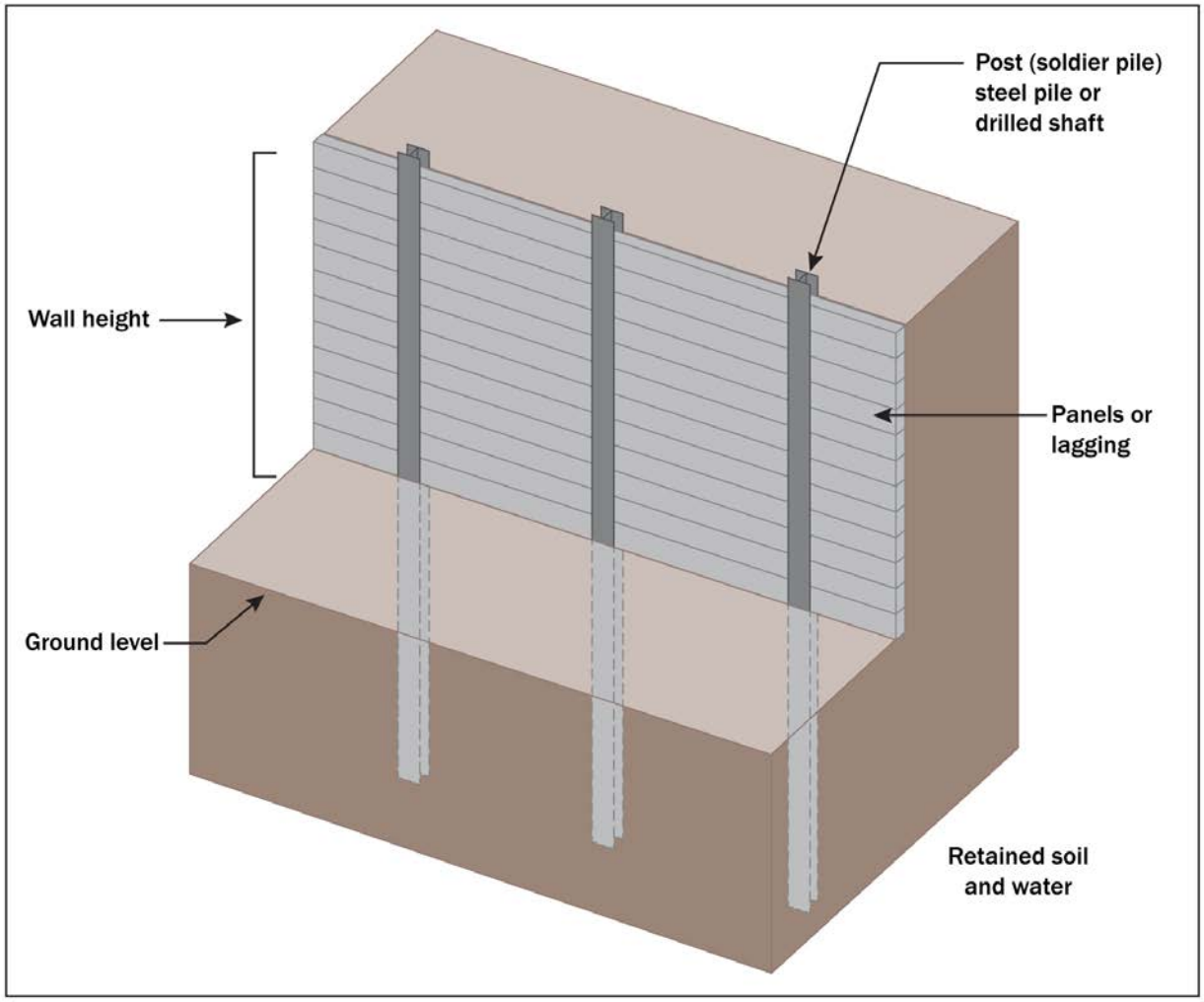

Figure 3-6. Discrete Cantilever Pile Wall Example

3.3. Alternatives Considered and Eliminated from Further Consideration

This section describes activities considered but eliminated from evaluation within the PEA because they are ineligible activities.

3.3.1. Activities with a Primary Purpose Not Related to Flood Control

Activities that do not have a primary purpose of addressing hazards related to flooding and are not connected actions to a covered flood control project are not eligible for coverage under this PEA.

3.3.2. Activities Ineligible for FEMA Funding

FEMA policies for the HMA and PA programs identify the eligible and ineligible types of activities under each program. Activities that are not eligible for funding under either program are not feasible alternatives to the Proposed Action alternative; therefore, they were not retained as alternatives for consideration under this PEA.

3.3.3. Non-Engineered or Ad Hoc Solutions

A licensed engineer must design flood control projects proposed for funding by FEMA. This PEA does not cover activities that are non-engineered or ad hoc. This may include projects that are not based on an engineering or hydraulic analysis or have an incomplete or inappropriate engineering analysis.

SECTION 4. Affected Environment and Consequences

This section describes the environment potentially affected by the alternatives, evaluates potential environmental impacts, and recommends measures to avoid or reduce those impacts. When possible, quantitative information is provided to establish potential impacts; the significance of potential impacts is based on the criteria listed in **Table 4-1**. The study area generally includes the project area and access and staging areas needed for the alternatives. If the study area for a particular resource category is different from the project area, the differences will be described in the appropriate subsection.

Table 4-1. Evaluation Criteria for Potential Impacts

Impact Scale	Criteria
None/Negligible	The resource area would not be affected, or changes or benefits would be either nondetectable or have effects that would be slight and local if detected. Impacts would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, although the changes would be small and localized. Impacts or benefits would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Changes to the resource would be measurable and have either localized or regional-scale impacts/benefits. Impacts would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary to reduce any potential adverse effects.
Major	Changes would be readily measurable and would have substantial consequences on a local or regional level. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, though long-term changes to the resource would be expected.

4.1. Resources Not Affected and Not Considered Further

Based on a preliminary screening of resources and the project's geographic location, the following resources do not require a detailed assessment because they do not exist within the study area, or the alternatives would have no effect on the resource.

- *Seismic Risks*. EO 12699, *Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction*, does not apply because there is low seismic risk throughout the study area.

- *Geology*. Rocky streams are generally not subject to flood risks and therefore are not anticipated to be the subject of flood mitigation projects. If a proposed project would impact bedrock, then an SEA would be required.

- *Wild and Scenic Rivers.* The Wild and Scenic Rivers Act, 16 U.S.C. §§ 1271 *et seq.*, is not applicable because any designated rivers within FEMA Region 5 are excluded from the study area covered by this PEA. Therefore, none of the alternatives would have the potential to affect rivers protected under the Act.

- *Coastal Barrier Resource Act*. Areas within the Coastal Barrier Resources System (CBRS) would not be eligible for FEMA grant funding because federal expenditures that support development within the CBRS are restricted. Therefore, CBRS are not covered under this PEA.

4.2. Physical Environment

4.2.1. Soils and Topography

Alternatives are evaluated for the potential to cause erosion, sedimentation, and compaction impacts on soils and topography—both short term during construction and over the long term. Potential impacts on soils and topography are assessed qualitatively by comparison with the surrounding environment. Therefore, this section presents existing conditions within the study area for this PEA related to soils and topography.

The Farmland Protection Policy Act (FPPA) of 1981, 7 U.S.C. §§ 4201 *et seq*., was enacted to minimize conversion of prime and unique farmland and farmland of statewide or local importance to nonagricultural uses and to ensure that federal programs are compatible with local, state, and private programs and policies to protect farmland. The FPPA does not consider areas already committed to urban uses as farmland (7 C.F.R. § 658.2[a]). If an individual project area is outside of an urban area, the Subapplicant should confirm whether the area contains farmland soils by using Natural Resources Conservation Service's (NRCS's) web soil survey. Projects that would result in the conversion of important farmland soils to non-farm uses would need to consult with NRCS and complete a land evaluation and site assessment (U.S. Department of Agriculture [USDA] 2022). While the presence of farms does not necessarily indicate farmland soils, they can provide an indication of which areas include protected farmland soils. Farms occupy 75 percent of the state of Illinois, and include approximately 73,400 farms. Farms occupy 64 percent of the land in the state of Indiana and include approximately 57,700 farms. Michigan includes approximately 51,500 farms, encompassing 27.5 percent of the state's land. Minnesota has 65,531 active farms, occupying approximately 51 percent of the state's land. Ohio has approximately 74,400 active farms, occupying approximately 53.5 percent of the state's land. The state of Wisconsin has approximately 68,900 farms, encompassing 41.5 percent of the state's land (Farmland Information Center 2024).

Much of the topography in the study area is characterized by rolling hills and valleys and flat prairie lands, formed by glacial deposits during the last ice age. However, there are areas that escaped glaciation and offer more rugged terrain such as steep hills, deep river valleys, dense forests, rocky coastlines, and dramatic elevation changes (**Figure 4-1**).

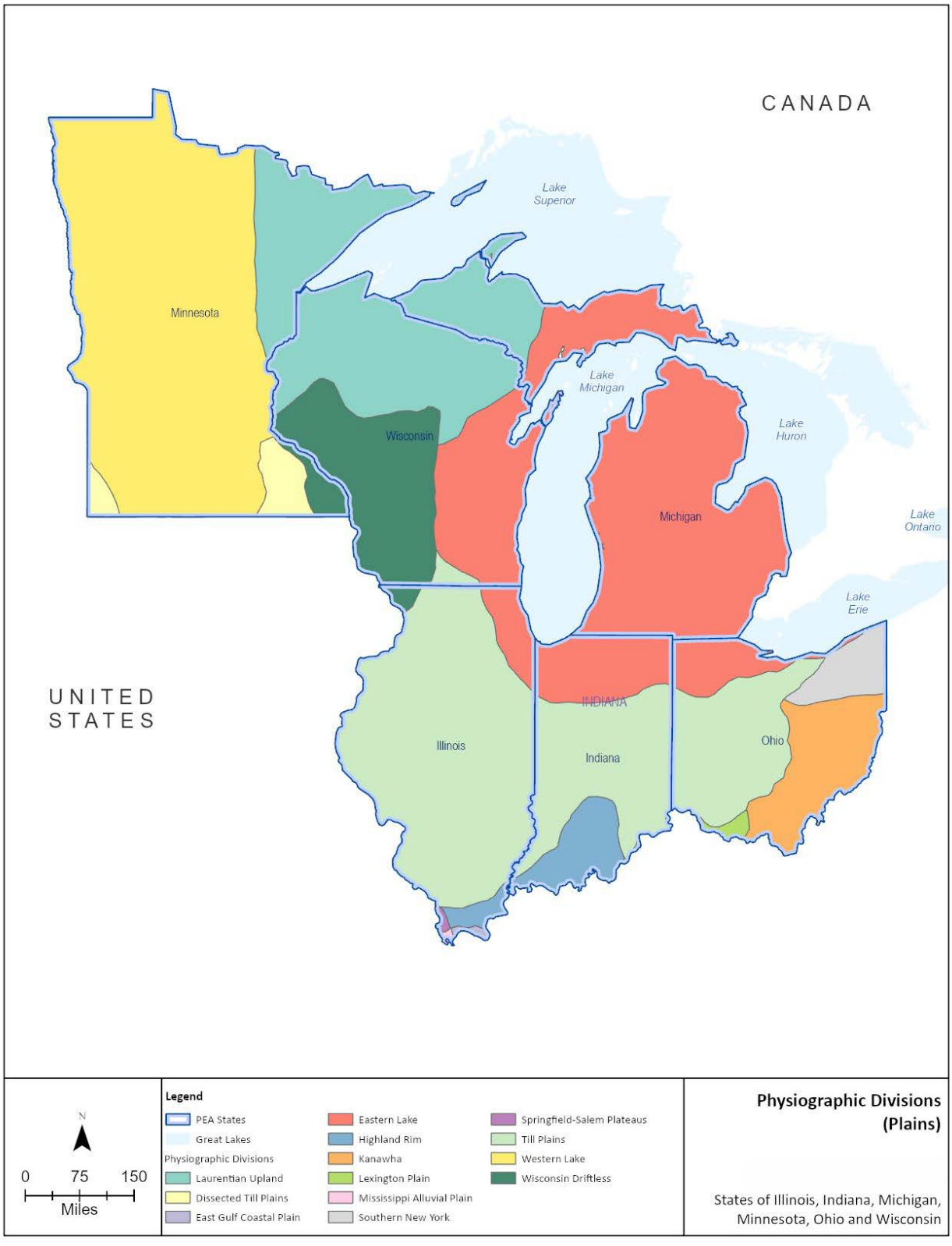

Figure 4-1. U.S. Geological Survey Physiographic Divisions (Plains)

Illinois: Illinois has six general physiographic divisions. The Till Plains encompasses most of the state. The Till Plains are characterized by gently rolling plains and fertile soils, as a result of glacial till deposits from the last ice age. The northwestern corner is part of the Wisconsin Driftless, while the northeastern corner of the state is part of the Eastern Lake Division. The Driftless Area is named for its lack of glacial sediment, or "drift," which left it untouched by the last glacier that covered most of Wisconsin 10,000 years ago. It is characterized by its rolling hills, bluffs, and deep river valleys. The southern portion of the state includes small areas of Highland Rim, Eastern Lake, Mississippi Alluvial Plain, and East Gulf Coastal Plain divisions (U.S. Geological Survey [USGS] 2024). The Highland Rim is a cuesta (hill or ridge with a gentle slope on one side and a steep slope on the other) surrounding a basin. The Eastern Lake is a section of the Interior Plains physiographic division. The Mississippi Alluvial Plain is an alluvial plain created by the Mississippi River. The northern Illinois region is predominantly rolling hills and valleys. This region also includes an area that escaped glaciation during the last ice age, and it features unique topography of steep hills and deep river valleys. Central Illinois is characterized by its flat prairie lands with minimal elevation changes. Southern Illinois is more rugged and forested compared to the northern and central regions. The lowest point in the state lies within this region, at the confluence of the Mississippi River and Ohio River, with an elevation of 315 feet (World Atlas 2024a).

The majority (45 percent) of Illinois' soil is classified under the Alfisols Order. Alfisols are fertile soils of the forest, formed in loamy or clayey material (University of Minnesota Extension 2021). The other predominant soil order in Illinois is Mollisols (43 percent), which is the basis for the state's productive agricultural base. The most distinguishing feature of these soils is a thick, dark surface layer that is high in nutrients (NRCS 2018).

The main types of parent materials of Illinois soils are loess, outwash, till, and alluvium. Other soil parent materials, such as bedrock weathered in place and plant remains, are present but not extensive in Illinois. Loess is the most extensive parent material in Illinois, occupying about 63 percent of the state's land area, predominating in the western, central, and southern parts. Loess is a silty wind deposit (USDA 1984).

Indiana: Indiana has three general physiographic divisions. The northern quarter of the state is in the Eastern Lake Division, and the southern quarter of the state is in the Highland Rim Division. The Till Plains encompass a majority of the central part of Indiana (USGS 2024). The region near Lake Michigan and the associated Morainal Complexes is characterized by their undulating topography, formed by glacial deposits. This region also includes various drainageways and valleys, many of which were carved by retreating glaciers. The valleys and drainageways provide a natural drainage network in this region. The southern part of the state (Highland Rim) includes a more varied topography, including plateaus, uplands, and rolling hills, descending into fertile lowlands. The landscape is a result of both erosional processes and sediment deposits from ancient waterbodies. The Ohio River forms the southern boundary of Indiana (World Atlas 2024b).

Approximately 75 percent of soil in the state of Indiana is classified under the Alfisols Order. The Mollisols Order encompasses approximately 15 percent of the soils along the eastern border of the state. Approximately 5 percent of the soil in the northwest corner of the state are in the Entisols

Order, and another 5 percent at the southern end are in the Ultisols Order. Most Entisols are very young soils and occur where soil parent materials have only recently been deposited, such as on very steep slopes or floodplains. Ultisols occur on old, stable landscapes and are formed under forest. The pH tends to be low, and aluminum often occurs in forms toxic to plants (NRCS 2024).

There are 13 soil regions in the state of Indiana. Thin loess over loamy glacial till (medium-textured, wet soils on Wisconsinan Till Plains) is the most predominant parent material. Clayey glacial till (fine-textured, wet soils on Wisconsinan Till Plains) is the second most predominant parent material in the state of Indiana (Purdue University 2004).

Michigan: Michigan has two general physiographic divisions. The Upper Peninsula is divided between the Laurentian Upland and the Eastern Lake Division, and the Lower Peninsula is dominated by the Eastern Lake Division (USGS 2024). The Laurentian Upland is the western extension of the Laurentian Mountains and part of the southern rim of the Canadian Shield that extends into the United States. The western part of the Upper Peninsula is characterized by rugged terrain formed by ancient volcanic activity and glaciation. This area is known for dense forests and a rocky coastline. The eastern part of the Upper Peninsula includes lower elevation and a smoother landscape. The Lower Peninsula is marked by rolling hills and an elevation that gradually decreases from the highlands toward the central part of the state. The northern portion is characterized by a flat to gently rolling landscape. The Black River and parts of the Inland Waterway traverse through this lowland area. A fertile agricultural region is in the east–central part of the Lower Peninsula. The region adjacent to Lake Michigan, along the western edge of the Lower Peninsula is characterized by sandy shores and dunes (World Atlas 2024c).

The soils of Michigan vary greatly, with more than 500 soils mapped in the state. Spodisols (sandy soils) are the most predominant soil order, mostly in the western and northern parts of the state. Spodisols are very sandy soils that are often formed under coniferous forest (NRCS 2024). Alfisols (clays and loams) are the next most common soil order, mostly in the southern Lower Peninsula (Sommers 1984).

Minnesota: Minnesota has three general physiographic divisions. The Western Lake Division (a section of the Interior Plains Physiographic division) encompasses most of the state. The northeast corner of the state is in the Laurentian Upland Division, and the southwest and southeast corners of the state belong in the Dissected Till Plains Division (USGS 2024). The northwestern part of Minnesota includes the remnants of the prehistoric Lake Agassiz and extends over the Lake of the Woods. The area is flat and fertile with occasional low rolling hills. The northeastern part of the state encompasses rugged terrain along the shores of Lake Superior. The Sawtooth Mountains run through this region and include Eagle Mountain, the highest point in Minnesota, at 2,301 feet. This region includes rocky cliffs and experiences dramatic elevation changes. The state's heartland includes gently rolling hills formed by glacial deposits and is prime land for farming. The southwestern part of Minnesota includes prairie lands and is part of the larger Greater Plains of North America (World Atlas 2024d).

The majority (32.1 percent) of Minnesota's soil is classified under the Mollisols Order, which is the basis for the state's productive agricultural base. The most distinguishing feature of these soils is a thick, dark surface layer that is high in nutrients. Alfisols comprise an additional 27.4 percent of Minnesota's soil. Alfisols are fertile soils of the forest, formed in loamy or clayey material (University of Minnesota Extension 2021).

Ohio: Ohio is divided into five physiographic divisions. The Eastern Lake Division is in the northwest corner, while the Southern New York Division is in the northeast corner. The Till Plains encompass the majority of the central–western part of the state, while the Kanawha Division encompasses a majority of the eastern part of the state. The Southern New York and Kanawha sections are a part of the larger Appalachian Highlands. The Lexington Plain Division is a small portion in the southwest corner of the state, and part of the Interior Low Plateaus (USGS 2024). The Till Plains feature gently rolling terrain created by glacial till deposits. The eastern and southeastern parts of Ohio are divided into two distinct areas: the Glaciated Allegheny Plateaus and the Unglaciated Allegheny Plateaus. The Glaciated Allegheny Plateaus feature rugged terrain, with the effects of glacial activity evident in the landscape's features. In contrast, the Unglaciated Allegheny Plateaus do not bear the marks of glaciation and have a much different topography, dominated by sharper ridges and valleys. A small section of the eastern part of the state (The Bluegrass Region) is characterized by rolling hills and meadows (World Atlas 2024e).

The primary soil order found in Ohio is Alfisols, covering approximately 75 percent of the state. The second most predominant soil order in Ohio is Inceptisols. Inceptisols are often found on fairly steep slopes, young geomorphic surfaces, and on resistant parent materials. They are often found in mountainous areas and are used for forestry, recreation, and watershed (NRCS 2024).

Ohio has more than 100 specific types of parent material; therefore, soils in Ohio are divided into 12 soil regions based primarily on soil parent material and the glacial history. The predominant soil regions in the state are Blount-Pewamo-Glynwood (Region 3), Bennington-Cardinton-Centerburg (Region 5), and Mahoning-Canfield-Rittman-Chili (Region 6). Soils in Region 3 were developed in glacial till containing considerable limestone material and clay, and their textures range from medium silt to fine clay. Soils in Regions 5 and 6 were also developed in glacial till, and are predominately medium textured, with some areas of fine texture (The Ohio State University [OSU] 2024).

Wisconsin: Most of Wisconsin is divided fairly equally into three physiographic divisions—the Laurentian Upland in the north, the Wisconsin Driftless in the southwest, and the Eastern Lake Division in the southeast. A small portion in the central–south part of the state is in the Till Plains (USGS 2024). The northernmost part of the state features a narrow, level plain that is a transitional area between the lake and a large, wooded upland that occupies the northern part of the state, with many lakes and wetlands. This region includes substantial elevation changes and is the epitome of Wisconsin's glaciated areas. The middle of Wisconsin is relatively flat with a gradual transition to the more rugged terrains in the east and west. The area surrounding the Mississippi River along the western edge of Wisconsin is characterized by its rugged terrain with steep bluffs and narrow valleys. The southeastern quadrant of the state features a series of ridges paralleling Lake Michigan. This region transitions from higher elevations to the low-lying areas adjacent to Lake Michigan and is

intersected by several significant rivers, including the Fox River and Milwaukee River (World Atlas 2024f).

Wisconsin's predominant soil order is Alfisols, covering approximately 50 percent of the state. The second most predominant soil order is Spodosols (found in the north), followed by Entisols and Mollisols (found in the south) (NRCS 2024).

Several hundred kinds of soils have been mapped in Wisconsin; thus, they have been divided into regions. Of the 14 major soil regions in the state of Wisconsin, four are most predominant—Soil Region G (Iron River, Gogebic, and Kennan loams over glacial till); Soil Region F (Withee, Santiago, Amery, and Antigo silt loams over acid loamy glacial till); Soil Region B (Dodge, Miami, Morley, and Casco silty soils over glacial till); and Soil Region A (Fayette and Dubuque silt loams) (Hole 1976).

Alternative 1 – No Action

Under the No Action alternative, communities may construct non-FEMA-funded minor projects that could include repairs, minor mitigation, and flood control projects. The No Action alternative would have minor, short-term, adverse, impacts on soils and topography from construction activities that disturb the ground, such as excavation and grading, and that may lead to increased erosion. Clearing and grading during construction would also result in the temporary loss of native vegetation and exposure of soils to the elements that could cause increased erosion. Site soils may be replaced with fill materials such as riprap or structures such as concrete or metal walls, and topography may be altered during grading for placement of levees.

In the long term, flood risks would not be substantively reduced. Over time, periodic flooding could move large amounts of sediment, causing soil loss and altering topography. Severe future flood events could result in atypical soil deposition or erosion. Soil instability may present increasing risk to nearby infrastructure, such as roads and utilities. In more rugged areas, where there are steep streambanks, erosion and flooding could have more severe impacts on topography. The No Action alternative may result in minor to moderate impacts on soils and topography depending on the extent and duration of flood impacts and relative to site characteristics.

Alternative 2 – Proposed Action

In the short term, construction activities that disturb the ground would have similar impacts on soils and topography as described in the No Action alternative. However, erosion and sediment control measures would be implemented in accordance with national, state, and county requirements. Specifically, construction of the Proposed Action would comply with the General Construction Stormwater Permit, which is required for construction disturbance of one or more acres and is discussed in greater detail in Section 4.2.2. In accordance with the General Construction Stormwater Permit, the project proponent would develop a Stormwater Pollution Prevention Plan (SWPPP) for specific proposals under the Proposed Action, which would require the implementation of measures to reduce pollutants in stormwater discharges and prevent sediment from leaving the construction site. Example control measures include minimizing areas of exposed soil, retaining natural buffers

around waters, and installing erosion control measures such as silt fencing. During construction, the Proposed Action would have minor, short-term, adverse impacts on soils and topography.

In the long term, both floodwalls and earthen levees would address issues related to flooding, including reducing the extent of flooding. By reducing the extent of flooding, these projects would help to conserve soils and protect existing topography. While earthen levees would result in additional soil and changes in topography, they would be revegetated or stabilized to reduce soil erosion and topography changes in the long-term. The Proposed Action would result in long-term, minor to moderate, beneficial impacts on soils and topography from the reduced risk of flooding.

The Proposed Action may have the potential to have negligible to no impacts on farmland soils, depending on the project location. There are no specific impacts or mitigation that would affect farmland or consistency with the FPPA. Most flood control projects would not irreversibly convert farmland to other uses. Flood control projects that reduce erosion and slope failure would have the potential to protect adjacent farmland soils from eroding. Therefore, the Proposed Action would likely be consistent with the FPPA. If NRCS requires further review of a specific project, FEMA would complete Form AD-1006 (NRCS 2022) and make a determination under the FPPA.

4.2.2. Water Resources and Water Quality

This section evaluates alternatives for the potential to degrade existing water quality conditions or impact surface and groundwater resources regulated by the Clean Water Act (CWA) of 1977, 33 U.S.C. §§ 1251 *et seq.*, and other federal, state, and international water quality laws.

Section 401 of the CWA gives states and tribes the authority to grant, deny, or waive certification of proposed federal licenses or permits for projects that result in discharges into Waters of the United States 33 U.S.C. § 1341. Furthermore, Section 401 also requires that, before a Section 404 permit (as discussed below) can be issued for an activity, the activity must not exceed state- or tribal-specific water quality standards. In the absence of an approved state or tribal water quality program, EPA administers the water quality regulations (EPA 2024a). Section 4.2.4, Wetlands, discusses states' implementations of Section 401.

The CWA further requires states to identify waters that do not or are not expected to meet applicable water quality standards with current pollution control technologies alone. On an annual basis, states issue a water quality report under Sections 305(b) and 303(d) of the CWA (referred to as the Integrated Water Quality Report) 33 U.S.C. § 1313. Section 303(d) authorizes EPA to assist states, territories, and authorized tribes in listing impaired waters and developing total maximum daily loads (TMDLs) for impaired waterbodies. A TMDL establishes the maximum amount of a pollutant or contaminant allowed in a waterbody and serves as the starting point or planning tool for restoring water quality. Impaired waterways can be identified using EPA's How's My Waterway tool (EPA 2024b).

Section 402 of the CWA regulates the discharge of pollutants or contaminants from point sources as well as stormwater runoff into waterways through National Pollutant Discharge Elimination System (NPDES) permits 33 U.S.C. § 1342. These permits limit what can be discharged into waterways and provide for project-specific monitoring and reporting requirements. Construction activities that have the potential to disturb soils that could lead to erosion and sedimentation must obtain and comply with a general construction NPDES permit for stormwater discharges.

Section 404 of the CWA regulates the placement of dredged or fill material into Waters of the United States, including wetlands, lakes, streams, rivers, and other waterways 33 U.S.C. § 1344. Through Section 404 permitting, EPA and USACE aim to avoid and minimize loss of wetlands and other water resources and to compensate for unavoidable loss through mitigation, restoration, enhancement, and creation. EPA and USACE jointly implement Section 404 in most states. In 1984, the state of Michigan received authorization from the federal government to administer Section 404 of the federal CWA in most areas of the state. USACE and Michigan Department of Environment, Great Lakes, and Energy (EGLE) jointly administer flood control projects that are near or adjacent to the shores of the Great Lakes (EGLE 2024). USACE comprises several districts and holds regulatory jurisdiction over specified areas. The overall study area is overseen by the St. Paul, Rock Island, St. Louis, Chicago, Detroit, Louisville, Buffalo, Huntington, Memphis, and Pittsburgh districts, which would manage the permits on behalf of USACE (**Figure 4-2**), as follows:

- Indiana is managed by three districts that include the Chicago District in the northwest, the Detroit District in the northeast, and the Louisville District in the south.
- Illinois is managed by four districts—the Rock Island District in the northwest, the Chicago District in the northeast, the St. Louis District in the southwest, the Louisville District in the southeast, and the Memphis district in the southern tip around Cairo.
- Michigan is managed by the Detroit District.
- Minnesota and Wisconsin are managed by the St. Paul District.
- Ohio is managed by three districts, with the Huntington District in the southern two-thirds of the state, the Buffalo District in the north, and the Pittsburgh District in the east.

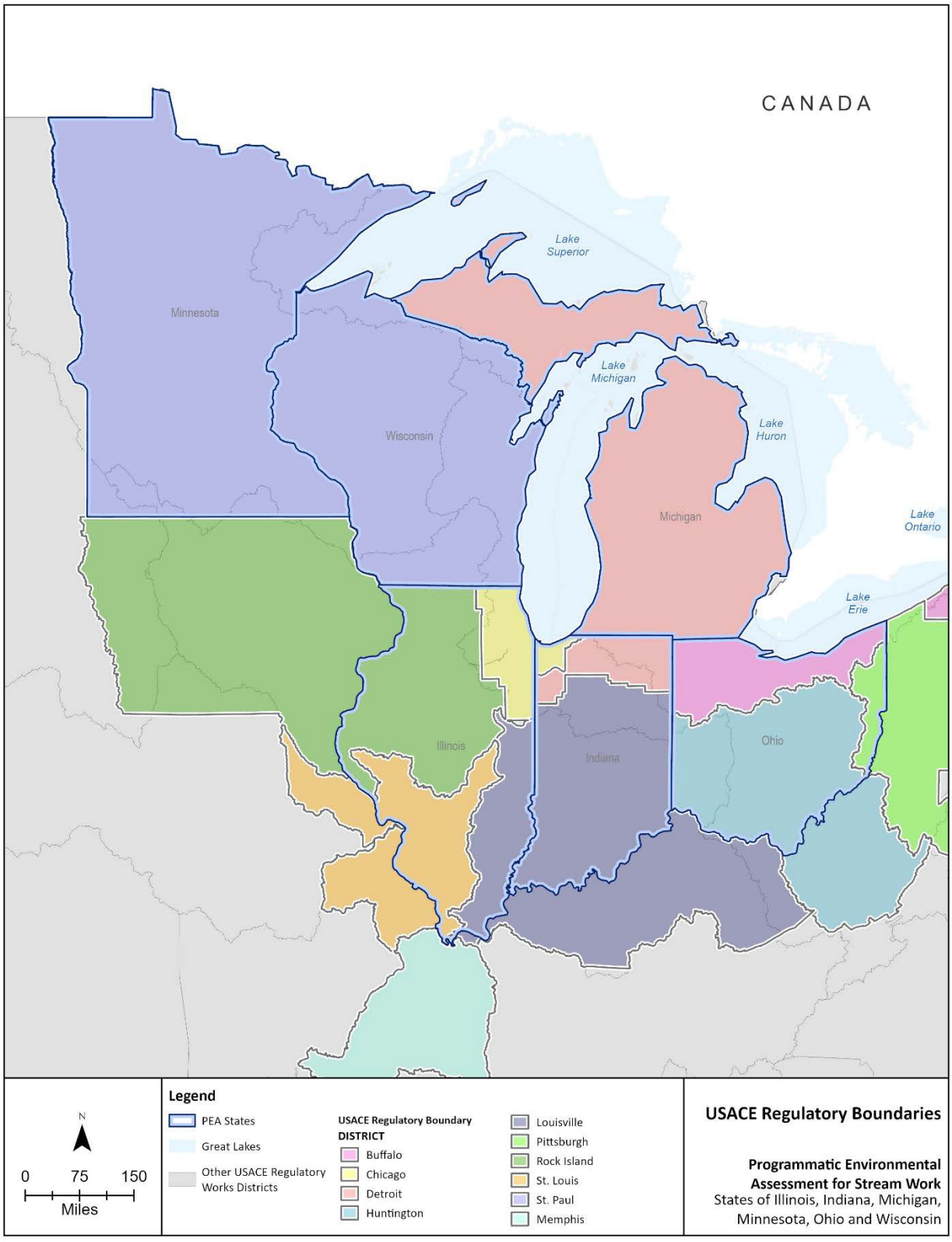

Figure 4-2. USACE Regulatory Districts

The Rivers and Harbors Act of 1899, 33 U.S.C. § 401 *et seq.*, regulates the development and use of the nation's navigable waterways. If proposed construction activities would occur below the Ordinary High Water Mark (OHWM), Sections 9 and 10 of the Rivers and Harbors Act may apply.

Section 9 of the Rivers and Harbors Act prohibits the construction of any bridge, dam, dike, or causeway over or in navigable waterways of the United States without congressional approval. While administration of Section 9, as it pertains to bridges and causeways, has been delegated to the U.S. Coast Guard, USACE regulates dams and dikes in navigable waters. Bridges, causeways, dams, or dikes in intrastate waters must be approved by state legislatures. In interstate waters, Section 9 permits require congressional approval. Similarly, under Section 10 of the Rivers and Harbors Act, the building of any wharfs, piers, jetties, and other structures is prohibited without approval of USACE. Under Section 10, USACE authorization is also required before any work above the OHWM that affects the course, location, condition, or capacity of navigable waters.

The Safe Drinking Water Act of 1974, 42 U.S.C. § 300f *et seq.* (amended in 1986 and 1996), was established to protect the quality of drinking water of all above or underground resources. This act authorizes EPA to establish water quality standards to protect drinking water and requires all owners or operators of public water systems to comply with those set criteria. Section 1424I of the Safe Drinking Water Act of 1974 authorizes EPA to designate an aquifer for special protection under the sole source aquifer program if (1) the aquifer is the sole or principal drinking water resource for an area (i.e., it supplies 50 percent or more of the drinking water in a particular area) and (2) if its contamination would create a significant hazard to public health.

The Great Lakes Restoration Initiative (GLRI) was launched in 2010 as a nonregulatory program to accelerate efforts to protect and restore the largest system of fresh surface water in the world, and to provide additional resources to accelerate progress toward the most critical long-term goals for this important ecosystem. Every five years, the GLRI develops action plans that identify goals, objectives, and measures of progress for five GLRI focus areas (GLRI 2019).

In 1972, the United States and Canada, recognizing the widespread deterioration of water quality in the Great Lakes on both sides of their shared border, signed the Great Lakes Water Quality Agreement (GLWQA) (revised in 1978; amended in 1983, 1987, and 2012) to restore and protect the waters of the Great Lakes. The GLWQA provides a framework for identifying priorities and implementing actions that improve water quality, clean up areas of concern, restore habitat, reduce nutrient pollution, and assess the overall health of the Great Lakes. The GLWQA includes the interaction and management of upstream impacts on the health of the Great Lakes within the Great Lakes Basin Ecosystem.

In addition to the federal acts and regulations described above, water quality is also regulated by state environmental agencies that set water quality standards and may have additional requirements for work in waters of the state. Subapplicants should coordinate with the appropriate state-specific governing agency for flood control projects, as listed in **Table 4-2**, to determine the applicable project-specific regulations and conditions. **Table 4-2** summarizes state-specific Section

401 Water Quality Certification Programs, the most recent Integrated Water Quality Report, and the Section 303(d) List for each state.

Table 4-2. Water Quality Regulations by State

State	State Regulatory Agency (Water Quality)	State Water Quality Regulation Reference and Documentation
Illinois	Illinois Environmental Protection Agency, Bureau of Water	Title 5, Chapter 415 Illinois Compiled Statutes: Environmental Protect Act (The Act) 17 Illinois Admin Code (Ill. Adm. Code) Part 3704: Regulation of Public Waters Rules 35 Ill. Adm. Code Part 302: Water Quality Standards 35 Ill. Adm. Code Part 395: Procedures and Criteria for Certification Title 40, Chapter I, Subchapter D, Part 132 Water Quality Guidance for the Great Lakes System Illinois Integrated Water Quality Report and Section 303(d) List, 2020/2022 – (Illinois EPA Bureau of Water [IEPA], 2022)
Indiana	Indiana Department of Environmental Management	Title 327 of the Indiana Administrative Code (Ind. Admin. Code); under Article 2 Designated Uses: 327 Ind. Admin. Code 2-1.5-5 Water Quality Criteria: 327 Ind. Admin. Code 2-1.5-8 and 2-1.5-16 WQBEL Development: 327 Ind. Admin. Code 5-2-11.4– through 11.6 Indiana Integrated Water Monitoring and Assessment Report to the U.S. EPA, 2022 (Indiana Department of Environmental Management [IDEM] 2022)
Michigan	Michigan Department of Environment, Great Lakes, and Energy	Sections 3103 and 3106 of 1994 Pub. Act 451, Michigan Compiled Laws (Mich. Comp. Laws) §§ 324.3103 and 324.3106 Michigan Administrative Code (Mich. Admin. Code) R.323.1000 Mich. Admin. Code R. 323.1041 to r 323.1117 (Activities resulting in a discharge of surface waters must comply with these standards.) Water Quality and Pollution Control in Michigan, 2022 Sections 303(d), 305(b), and 314 Integrated Report (EGLE 2022)

State	State Regulatory Agency (Water Quality)	State Water Quality Regulation Reference and Documentation
Minnesota	Minnesota Pollution Control Agency	Minnesota Statues Chapters 115 and 116 and Minnesota Administrative Rules §§ 7001.1400–7001.1470, and Chapters 7050, 7052, and 7053. 2024 Minnesota Water Quality (Minnesota Pollution Control Agency, November 2023)
Ohio	Ohio Environmental Protection Agency	Ohio's water quality standards, set forth in Chapter 3745-1 of the Ohio Administrative Code Ohio 2022 Integrated Water Quality Monitoring and Assessment Report (Ohio Environmental Protection Agency, Division of Surface Water Final Report, February 2022) Ohio Revised Code § 1501.30
Wisconsin	Wisconsin Department of Natural Resources	Wisconsin Statutes § 35.93 Chapter NR 102: Water Quality Standards for Wisconsin Surface Waters Wisconsin Water Quality Report to Congress, 2022 (Wisconsin Department of Natural Resources [WDNR] 2022)

Illinois has approximately 119,299 miles of streams and rivers and more than 2,900 lakes and 84,000 ponds. In the 2022 Integrated Water Quality Report, the Illinois Environmental Protection Agency (IEPA) assessed a total of 18,508 miles, or approximately 15.5 percent of the total miles of stream in Illinois, for attainment of one or more of the following designated uses: aesthetic quality, aquatic life, indigenous aquatic life, primary contact recreation, public and food processing, and fish consumption. The major potential causes of stream impairment are fecal coliform bacteria, mercury, polychlorinated biphenyls (PCBs), low dissolved oxygen, physical habitat alterations, high phosphorus, excessive siltation, high total suspended solids, atrazine, iron, simazine, and nitrate (IEPA 2024a). There is one sole source aquifer within Illinois, the Mahoment Aquifer, in the central portion of the state (EPA 2024c) (**Figure 4-3**).

Indiana has approximately 63,500 miles of streams and rivers and approximately 1,000 lakes. Since 2002, IDEM has assessed approximately 33,904 miles of streams for full body contact recreational use, 8,865 miles for human health and wildlife use, 23 miles for public water supply use, and 36,653 miles for warm water aquatic life use. The major potential causes of stream impairments include pathogens, PCBs, and mercury (IDEM 2022). There is one sole source aquifer within Indiana, the St. Joseph Aquifer, along the northern central border of the state (EPA 2024c) (**Figure 4-3**).

Michigan has approximately 76,000 miles of streams and rivers and more than 11,000 lakes. Michigan assesses surface water quality health for the following designated areas: agriculture, navigation, industrial water supply, warmwater fishery, other indigenous aquatic life and wildlife, partial body contact recreation, and fish consumption. The major potential causes of stream impairment included PCBs and mercury. Additionally, per- and polyfluoroalkyl substances comprise

an emerging group of contaminants that may impact water quality (EGLE 2022). No sole source aquifers are within the state of Michigan (EPA 2024c).

Minnesota has approximately 105,000 miles of streams and rivers and approximately 15,000 lakes. Minnesota has adopted a watershed-based management approach where the Minnesota Pollution Control Agency and its partners evaluate waters in each major watershed in Minnesota every 10 years. Each watershed is evaluated for the following designated uses: aquatic consumption, aquatic life, aquatic recreation, drinking water, limited resource value, and wild rice production. The major potential causes of stream impairment include low dissolved oxygen, *Escherichia coli* (*E. coli*), mercury, PCBs, and sulfates. There is one sole source aquifer within Minnesota, the Miles Lacs sole source aquifer, in the central–eastern portion of the state (EPA 2024c) (**Figure 4-3**).

Ohio has approximately 25,000 miles of streams and rivers and 400 lakes. Each stream and river is evaluated for the following designated uses: human health use (fish tissue), recreation, aquatic life, and drinking water. The major concerns for each designated use include the following (Ohio Environmental Protection Agency 2022):

- Human Health Use – PCBs and mercury
- Recreation – Bacteria
- Aquatic Life – Nutrient enrichment, sedimentation, and organic enrichment
- Drinking Water – Nitrate, atrazine, and cyanotoxin

There are two sole source aquifers within Ohio, the Allen County Area Combined Aquifer System, which is in the central–western section of the state, and the Greater Miami Buried Aquifer, which is in the southwestern section of the state (EPA 2024c) (**Figure 4-3**).

Wisconsin has approximately 88,000 miles of streams and rivers, which include more than 15,000 lakes. Each stream and river is evaluated for the following designated uses: aquatic life, recreation, public health and welfare, and wildlife. The major potential causes of stream and river impairments include total phosphorus, chlorophyll a, mercury, total suspended solids, PCBs, and low dissolved oxygen (WDNR 2022). No sole source aquifers are within the state of Wisconsin (EPA 2024c).

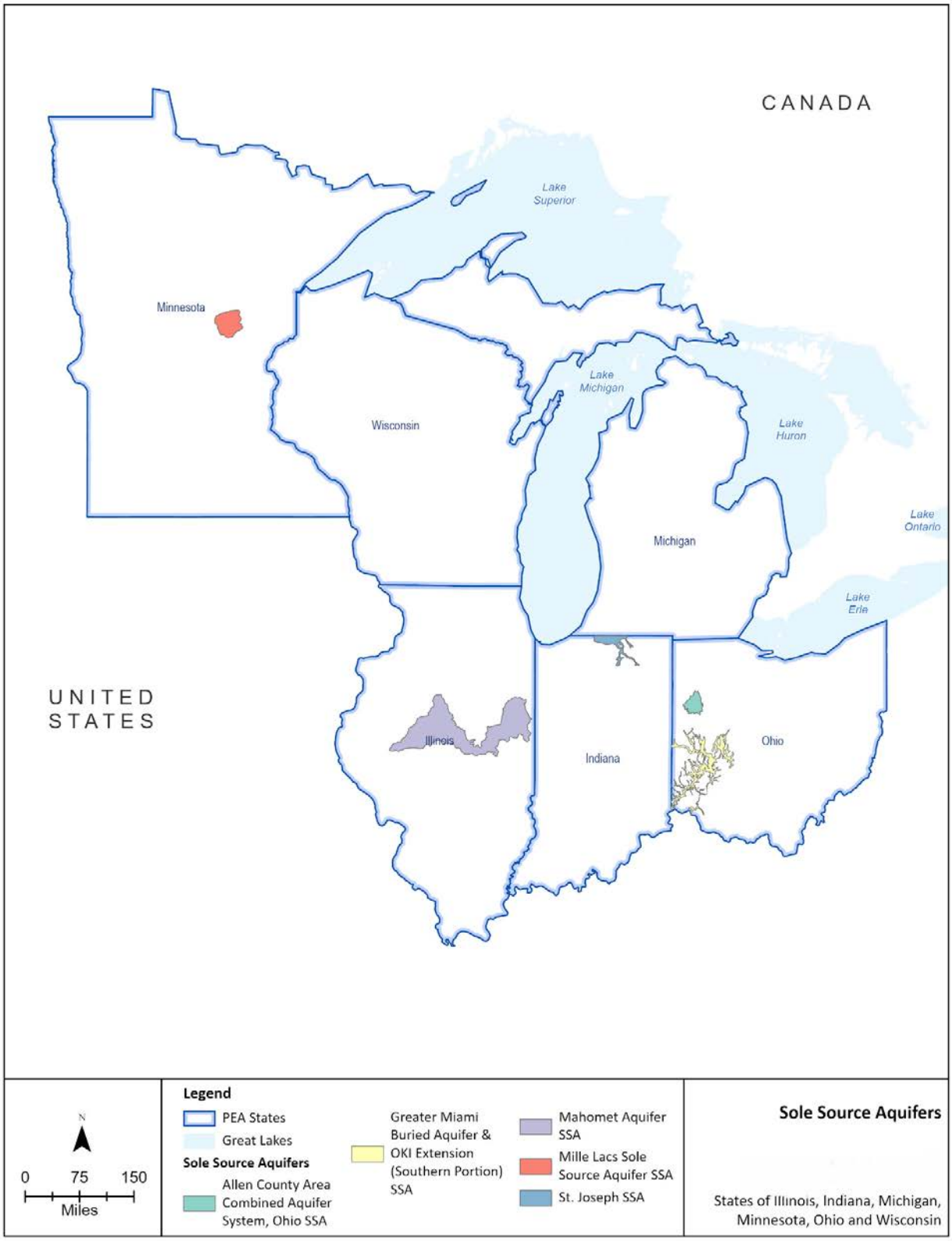

Figure 4-3. Sole Source Aquifer Locations

Alternative 1 – No Action

Under the No Action alternative, construction associated with minor flood control projects could potentially cause sediment and pollutants to enter waterways. Some of these measures may require in-water work that could further contribute to sedimentation and may potentially alter waterways. However, these project types would be required to adhere to the CWA and state waterway regulations, including obtaining necessary permits that would have mitigation and BMPs to minimize impacts on waterways. These measures would be smaller in scale and would likely not provide the same level of hazard mitigation, repair, or resilience as the Proposed Action described in this PEA. Therefore, if projects under the No Action alternative adhere to permitting requirements, there would be minor, short-term, adverse impacts from construction activities.

Although minor measures under the No Action alternative would have some mitigative effects, these effects would be limited because the measures likely would be smaller in scale and less comprehensive than the Proposed Action. Thus, the risk of flooding would not be substantially reduced, and sediments and pollutants would continue to be transferred into surface waters via floodwaters, leading to an increase in the level of impairment in waterways. For streams that empty into lakes, including the Great Lakes, this also could lead to localized impacts on the water quality of the lakes at the mouth of the impacted stream. Therefore, there may be a minor to moderate, long-term, adverse impact on waterbodies under the No Action alternative. Further, receding floodwaters that have been contaminated by pollutants could percolate down to the sole source aquifers within the region, causing a minor, long-term, adverse impact on aquifer health and groundwater quality.

Alternative 2 – Proposed Action

In the short term, construction activities that disturb the ground, such as excavation and grading, may lead to increased erosion to and sedimentation of surface waters. Clearing and grading during construction could also result in the temporary loss of native vegetation and exposure of soils to the elements that could cause increased erosion and sedimentation. Before construction, the subapplicant would coordinate with USACE and their respective state agency listed in Table 4-2 to obtain any required CWA permits. Potential erosion issues would be minimized by following all conditions within any acquired CWA permits and federal, state, and local regulations that require erosion control, including developing a SWPPP. Pollutants such as oils, lubricants, and other hazardous materials have the potential to percolate down to aquifers because of spills and leaks from construction equipment. Project activities would need to adhere to state and local regulations to reduce the risk of hazardous leaks and spills; therefore, there would be a minor, short-term, adverse impact from construction activities.

In the long term, the Proposed Action would reduce inland flooding and flooding of structures and complexes, reducing the potential for contaminated runoff to enter surface waters. Contaminants could be transferred by floodwaters into waterbodies that are not meeting TMDLs, further degrading the quality of these waters. Reduced flooding would mitigate potential flood-related spills that could also contaminate waters and percolate into groundwater and aquifers. Therefore, there would be a long-term, minor to moderate benefit on surface water and groundwater quality.

Projects resulting in permanent long-term impacts, such as permanent adverse impacts from fill and loss of Waters of the United States, may require compensatory mitigation. Such projects would need to prepare an SEA. Further, the beneficial effects on water quality would be consistent with the PR&G guiding principle on healthy and resilient ecosystems described in the PR&G analysis (Appendix A). Beneficial effects on water quality would also benefit public safety and wellbeing as showing in the conceptual model for ecosystem services.

4.2.3. Floodplains

EO 11988, *Floodplain Management*, requires federal agencies to minimize occupancy and modification of the floodplain. Specifically, EO 11988 prohibits federal agencies from funding construction in the 100-year floodplain (defined as an area with a 1-percent annual chance of flooding), unless there are no practicable alternatives. FEMA's regulations for complying with EO 11988 are found in 44 C.F.R. Part 9. Under the NFIA, 42 U.S.C. § 4001 *et seq.* and its implementing regulations, 44 C.F.R. Part 60, communities must meet certain floodplain development standards to participate in the National Flood Insurance Program (NFIP). Updated information on the number of NFIP participating communities within each state and the state-specific NFIP implementing agency is provided in the Community Status Book on FEMA's website (FEMA 2024b). The subapplicant shall coordinate with the local participating community to obtain permits and acquire any necessary approval for construction within the floodplain, as state permits may not cover all minimum NFIP requirements for a given project. In particular, local participating communities may apply for a Conditional Letter of Map Revision (CLOMR) if a given project could potentially modify the existing special flood hazard area (SFHA) and/or floodway. This letter from FEMA would provide comments on whether a proposed project meets minimum NFIP standards. If the CLOMR indicates that a project would result in the modification of the existing regulatory floodway, the effective Base Flood Elevations (BFEs), or SFHA, a letter of map revision officially showing the changes to the floodplains, regulatory floodways, or flood elevations would be required.

Illinois: In accordance with Title 17 of the Illinois Administrative Code, 17 Ill. Admin. Code § 3700, all construction activities that occur in the floodways must obtain permits from the Illinois Department of Natural Resources (DNR) Division of Water Resource Management before construction. Similarly, in urban areas where the stream drainage area is 1 square mile or more, or in rural areas where the stream drainage area is 10 square miles or more, all construction activities require a permit from Illinois DNR's Division of Water Resource Management before construction.

Indiana: The Indiana Flood Control Act (Indiana Code § 14-28-1) requires that any person proposing to construct a structure, place fill, or excavate material at a site within the floodway of any river or stream, unless that activity is exempted, must obtain the written approval of the Indiana DNR before initiating the activity.

Michigan: The State of Michigan's Floodplain Regulatory Authority, found in Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act (NREPA), 1994, Public Act 451, as amended, requires that a floodplain permit be obtained before altering or

occupying the 100-year floodplain of a river, stream, or drain. The applicable regulation is Floodways and Floodplains, Michigan Administrative Code Sections R.323.1311 through 323.1329.

Minnesota: The Minnesota floodplain ordinance is contained in Minnesota Statutes Section, 103F; Minnesota administrative rules 6120.5000 through 6120.6200; and the planning and zoning enabling legislation. In addition, the Minnesota Shoreland Management Act authorizes the Shoreland Rules that regulate all land zoning within 1,000 feet of classified public waterbodies, or 300 feet of classified public water rivers or streams, or the landward extent of their floodplains. The purpose of the Shoreland Rules is to manage the effects of shoreland and water surface crowding to prevent pollution of surface and ground waters of the state, to provide ample space on lots for sewage treatment systems, to minimize flood damage, to maintain property values, to maintain values of significant historic sites, and to maintain natural characteristics of shorelands and adjacent water areas. Shoreland controls must regulate lot sizes, placement of structures, and alterations of shoreland areas.

Ohio: In accordance with Ohio Revised Code Title 14 § 1521.13, development in the 100-year floodplain must be protected to at least the 100-year flood level. Floodwater conveyance must be maintained, at a minimum, in accordance with standards established under the NFIP. Before the expenditure of money for or the construction of buildings, structures, roads, bridges, or other facilities in locations that may be subject to flooding or flood damage, all state agencies and political subdivisions must notify and consult with the Ohio DNR Division of Water Resources and must furnish information that the division reasonably requires to avoid the uneconomic, hazardous, or unnecessary use of floodplains in connection with such facilities.

Wisconsin: The Wisconsin Shoreline Management Program has established shoreline zoning rules that apply to the landward side of a floodplain, as identified in the Wisconsin Administrative Code, DNR, Chapter 115. Furthermore, shoreland areas in unincorporated (town) areas are regulated by county shoreland zoning ordinances, which are required to meet or exceed the minimum requirements set forth by the Wisconsin Shoreline Management Program. These ordinances require a floodplain development permit for any development occurring within the regulatory floodplain.

FEMA produces Flood Insurance Rate Maps (FIRMs) that map floodplains and are used to determine whether an action is in the floodplain. FIRMs depict calculated locations of the 1percent (100-year) and the 0.2-percent (500-year) floodplains, coastal high hazard areas, and BFE levels. FEMA also produces Advisory Base Flood Elevation maps as an interim product to assist flood-impacted communities in their rebuilding efforts while the agency completes new FIRMs. FIRMs may not map floodplains for all streams, especially in remote areas with minimal development.

Alternative 1 – No Action

Under the No Action alternative, there could be some construction associated with minor mitigation measures occurring within the floodplain that could alter the floodplain or potentially release pollutants and sediments into the floodplain. Thus, there would be a negligible to minor, short-term, adverse impact on floodplains.

In the long term, facilities would continue to be vulnerable to flood risks in the absence of comprehensive levee or floodwall projects. The benefits of flood control measures under the No Action alternative would be limited because the measures likely would be smaller in scale and less comprehensive than the flood control measures under the Proposed Action. There would continue to be periodic flooding of structures and facilities, putting people at risk of harm and property at risk of damage. Periodic flood events would cause pollutants and sediment to enter the floodplain and waterbodies as floodwaters recede, which would impact water quality as described in Section 4.2.2. This would result in adverse effects on the natural value and function of floodplains. Thus, the No Action alternative would have a minor to moderate, long-term, adverse impact from flood risks and impacts on floodplains.

Alternative 2 – Proposed Action

Under the Proposed Action, construction activities could cause the potential release of sediments and pollutants into the floodplain. These impacts would be minimized by following all permit conditions related to sediment control described in Section 4.2.2. Thus, there would be a minor, short-term, adverse impact on floodplains. Furthermore, subapplicants would be required to comply with state and local floodplain and floodway regulations, including coordination with their local floodplain manager, to ensure impacts on floodplains would be minimized.

In the long term, levee and floodwall projects would reduce inland, facility, and complex flooding, protecting people and property from flood impacts and decreasing the level of sediments and pollutants entering the floodplain from floodwaters. Therefore, there would be a minor to moderate benefit on floodplain resources. Levees and floodwalls may have the potential to cause upstream and downstream increases in flood levels. A hydrologic and hydraulic study would be required for flood mitigation projects to ensure there would be no increase in upstream and downstream flooding. Any project where the hydrologic and hydraulic study shows increased flood elevations in or near the project area would require certain additional steps, processes, and required actions to maintain compliance with the NFIP regulations. If a modification to the existing regulatory floodway, BFEs, or SFHA is anticipated, the Subapplicant would request to obtain a CLOMR through procedures set in 44 C.F.R. 72. FEMA will apply the 8-Step Decision-Making Process in accordance with 44 C.F.R. Part 9.6(b) to consider site-specific impacts of proposed projects before approval to consider alternatives and mitigation measures. Additionally, protecting infrastructure from flooding would have beneficial effects consistent with the following PR&G principals: healthy and resilient ecosystems, sustainable economic development, and public safety (Appendix A).

4.2.4. Wetlands

EO 11990, *Protection of Wetlands*, requires federal agencies to consider alternatives to work in wetlands and limits potential impacts on wetlands if there are no alternatives. FEMA regulation 44 C.F.R. Part 9, Floodplain Management and Protection of Wetlands, sets forth the policy, procedures, and responsibilities to implement and enforce EO 11990 and prohibits FEMA from funding activities in a wetland unless no practicable alternatives are available.

If work within wetlands is necessary to complete a project, federal, state, and local permits and mitigation may be required. Wetland impacts may require a Section 404 permit from USACE. State and local permits may be required even if a federal permit is not. If wetland impacts are unavoidable, compensatory mitigation may be required by federal and state authorities. If compensatory mitigation is likely to be required for a specific project, then an SEA would need to be prepared to address wetland impacts and provide for proper public review.

Illinois: IEPA issues Section 401 Water Quality Certifications for projects that require a Section 404 permit from USACE for wetland impacts. Illinois DNR also reviews all applications for USACE authorization for impacts on existing environmental conditions, including fish and wildlife habitat, floodplain and wetland functions, and other environmental effects. The Illinois DNR Office of Water Resources receives most of its authority from the Interagency Wetlands Policy Act of 1989 and peripheral authority through the state's Rivers, Lakes, and Streams Act (615 Ill. Comp. Stat. § 1994). Illinois DNR also issues permits for construction and other activities in the public waters of the state, which include the commercially navigable streams of the state and the backwater areas of those streams, which would include wetlands.

Indiana: IDEM issues Section 401 Water Quality Certifications for projects that require a Section 404 permit from USACE for impacts on wetlands. If isolated wetlands (not regulated by USACE) are encountered, one of two State Isolated Wetland Permits must be obtained through IDEM—the Isolated Wetland General Permit or the Isolated Wetland Individual Permit. Isolated Wetland Permits are required under Indiana's Isolated Wetlands Law (Ind. Code § 13-18-22) and the rule implementing the law (327 Ind. Admin. Code 17). Impacts on nonexempt Class I isolated wetlands, regardless of the acreage of impact, are commonly regulated by the Isolated Wetlands General Permit. An impact of 0.1 acre or less to a nonexempt Class II isolated wetland is also usually regulated under an Isolated Wetland Permit.

Michigan: EGLE administers its own Section 404 program, as explained in Section 4.2.2. EGLE has adopted administrative rules that provide clarification and guidance on interpreting the state 1979 NREPA, as amended in 1994, Public Act 451, Part 303 for Wetlands Protection. In accordance with Part 303, wetlands are regulated if they meet any of the following criteria:

- Connected to one of the Great Lakes or Lake St. Clair
- Within 1,000 feet of one of the Great Lakes or Lake St. Clair
- Connected to an inland lake, pond, river, or stream
- Within 500 feet of an inland lake, pond, river, or stream
- Not connected to one of the Great Lakes or Lake St. Clair, or an inland lake, pond, stream, or river, but are more than 5 acres in size

- Not connected to one of the Great Lakes or Lake St. Clair, or an inland lake, pond, stream, or river, and less than 5 acres in size, but EGLE has determined that these wetlands are essential to the preservation of the state's natural resources and has notified the property owner

- Any waters that meet the definition of a Water of the United States under the federal CWA

A permit from the Michigan EGLE is required before beginning any of the following activities:

- Deposit or permit the placing of fill material in a wetland

- Dredge, remove, or permit the removal of soil or minerals from a wetland

- Construct, operate, or maintain any use or development in a wetland

- Drain surface water from a wetland

Although a federal review is not required for the majority of applications in inland areas under Michigan's Section 404 jurisdiction, federal agencies (USACE and U.S. Fish and Wildlife Services [USFWS]) must review projects that impact critical environmental areas, or that involve major discharges. Projects that may require federal review include the following:

- Major Discharges:

    - Projects affecting one or more acre of wetland

    - New construction of breakwaters or seawalls with a total length of more than 1,000 feet

    - Enclosure of more than 300 feet of a stream in one or more segments

    - Relocation or channelization of more than 1,000 feet of a stream in one or more segments

- Projects with potential to affect endangered or threatened species as determined by USFWS

- Discharges to waters of another state, suspected to contain toxic pollutants or hazardous substances, within proximity of a public water supply intake, or within defined state or federal critical areas

In addition, some wetlands in coastal areas (called environmental areas) are given further protection under Part 323 of the NREPA. Any dredging, filling, grading, or other alteration of the soil, natural drainage, or vegetation used by fish or wildlife, or placement of permanent structures in an environmental area requires a permit. Part 323 of the NREPA designates environmental areas up to 1,000 feet landward of the OHWM of a Great Lake or of waters affected by levels of the Great Lakes.

Minnesota: The Minnesota Pollution Control Agency issues Section 401 Water Quality Certifications for projects that require a Section 404 permit from USACE for wetland impacts. The Minnesota DNR regulates activities in public waters, which includes most lakes, rivers, streams, and "public waters wetlands." Public waters wetlands generally include wetlands 10 or more acres in size in unincorporated areas or 2.5 or more acres in incorporated areas. Public waters are defined as all water basins and watercourses that meet the criteria set forth in Minnesota Statutes, Section 103G.005.

In addition, the Wetland Conservation Act regulates wetlands in Minnesota that are not public waters and are administered by local governments with oversight by the Minnesota Board of Water and Soil Resources. Some local governments and watershed districts have adopted their own wetland and wetland buffer ordinances. Specific projects would need to check with the city, county, or watershed district that encompasses the project area for local permitting requirements or ordinances.

Ohio: The Ohio Environmental Protection Agency issues Section 401 Water Quality Certifications for projects that require a Section 404 permit from USACE for impacts on wetlands. The state also regulates isolated wetlands and issues Isolated Wetland Permits through the Ohio Rev. Code §§ 6111.02 through 6111.028.

Wisconsin: The WDNR issues 401 Water Quality Certifications for projects that require a Section 404 permit from USACE for wetland impacts. In addition, the WDNR also implements a three-tier system of authorization based on the projected level of environmental impact, which includes exemptions, general permits, and individual permits. The WDNR determines compliance with the requirements of Section 281.36, Wisconsin Statutes (Wis. Stat.), and the following provisions of WDNR's Administrative Code, DNR 299 and DNR 103. State regulations require avoidance and/or minimization of wetland fill and has exemptions for nonfederal (nonjurisdictional) wetlands as well as wetlands created artificially prior to August 1, 1991, and that have been modified by human activity that changed the landscape, with some exceptions.

WDNR has issued general permits for projects that have minimal, adverse, environmental impacts including the following:

- The project's purpose is to build, reconstruct, or maintain a recreational structure or facility.
- The project's discharge does not affect more than 10,000 square feet (0.23 acre) of wetland.
- Discharge will not occur in Great Lakes ridge and swale complexes, interdunal wetlands, coastal plain marshes, emergent marshes containing wild rice, southern sphagnum bogs, boreal rich fens, or calcareous fens.
- The project will be constructed in a manner that will maintain wetland hydrology in the remaining wetland complex.

- The project meets or exceeds the stormwater management technical standards of Natural Resources' administrative code sections NR 151.11 and 151.12 for stormwater discharges.

- The activity must not result in significant adverse impacts on fishery spawning habitat, including obstruction of fish passage, obstruction of bird breeding areas, or movement of species that normally migrate from open water to upland or vice versa. The activity will not result in adverse impacts on historical or cultural resources and will comply with Section 44.40 of Wisconsin Statutes.

For those projects that do not meet the standards to be eligible for an exemption or general permit, individual permits are available. All wetland individual permits require wetland compensatory mitigation.

Alternative 1 – No Action

Under the No Action alternative, there would be some construction associated with minor flood control measures that could occur within or adjacent to wetlands and potentially result in dredging or filling those wetlands and/or release of pollutants and sediments into those wetlands. These projects would be required to adhere to the CWA and state wetland regulations to minimize impacts on wetlands. Although minor measures under the No Action alternative would have some long-term mitigative effects, the risk of flooding would not be substantially reduced, and sediments and pollutants would continue to be transferred into wetlands via floodwaters. Therefore, potential impacts on wetlands would be minor to moderate and adverse, in both the short and long term.

Alternative 2 – Proposed Action

Construction of the Proposed Action has the potential to result in minor, short-term, adverse impacts if wetlands were to be directly disturbed or impacted by construction activities within or adjacent to wetlands. Short-term adverse impacts may also occur if the construction activities occurring within or near wetlands increase sedimentation or turbidity within wetland waters.

There may be impacts beyond the project footprint if a project affects sources of hydrology or requires filling portions of wetlands. When partially filled or converted, the remaining wetland may experience declines in functions, values, and habitat quality; changes in hydrology and natural flow within the wetlands; and spread of invasive species. This PEA presumes that projects and any connected actions would follow any CWA permit conditions to minimize impacts on wetlands. The PEA also presumes projects would be designed to avoid permanent impacts on wetlands. If a project or a measure would adversely affect wetlands in such a way that a regulatory agency would require compensatory mitigation, then an SEA must be prepared that addresses these additional impacts on wetlands that are not otherwise evaluated. Therefore, individual projects covered under this PEA may have no impacts on wetlands or up to minor adverse impacts on wetlands, both in the short and long term, as projects would follow all required permitting conditions. Additionally, in the long term, levee and floodwall projects would reduce the risk and extent of flooding, potentially decreasing the level of sediments and pollutants transferred by floodwaters into wetlands. Therefore, there would be a minor to moderate, long-term, benefit on wetlands.

4.2.5. Air Quality

EPA regulates air quality under the jurisdiction of the Clean Air Act (CAA) of 1970, 42 U.S.C. §§ 7401 *et seq.*, and its amendments. EPA has generally applied a two-pronged approach to controlling air pollution: (1) setting National Ambient Air Quality Standards (NAAQS) that define maximum pollution levels in the air that are still protective of human health and welfare and (2) developing emission standards for sources of air pollutants to reduce pollutant emissions to the atmosphere. NAAQS have been established for specific pollutants, referred to as criteria pollutants, which include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter (PM). EPA designates locations that do not meet or that persistently exceed one or more of the NAAQS as nonattainment or maintenance areas.

Federally funded actions in nonattainment and maintenance areas are subject to EPA conformity regulations, 40 C.F.R. Parts 51 and 93. The air conformity analysis process ensures that emissions of air pollutants from planned federally funded activities would not affect the state's ability to achieve the CAA goal of meeting the NAAQS. Section 176(c) of the CAA requires that federally funded projects must not cause any violations of the NAAQS, increase the frequency or severity of NAAQS violations, or delay timely attainment of the NAAQS or any interim milestone. Activities that would cause an exceedance of the NAAQS or cause an area to fall out of attainment status would be considered a significant impact. Emissions from construction activities are subject to air conformity review.

Under the general conformity regulations, a determination for federal actions is required for each criteria pollutant or precursor in nonattainment or maintenance areas where the action's direct and indirect emissions have the potential to emit one or more of the six criteria pollutants at rates equal to or exceeding the prescribed de minimis rates for that pollutant. The prescribed annual rates are 50 tons of volatile organic compounds, 100 tons of nitrogen oxides (O_3 precursors), and 100 tons of $PM_{2.5}$ (particulate matter in the air that is 2.5 micrometers or less in diameter), SO_2, or nitrogen oxides ($PM_{2.5}$ and precursors).

The status of nonattainment and maintenance areas is available through EPA's Green Book, which is updated periodically (EPA 2024d). **Table 4-3** summarizes counties in nonattainment status within the study area, as well as the state agencies responsible for regulating air quality in each state. Most of the nonattainment counties are not meeting standards for 8-hour O_3, followed by SO_2 (EPA 2024d).

Table 4-3. State Air Quality Regulatory Agencies and Counties in Nonattainment Status within the Study Area

State	State Regulatory Agency (Air Quality)	Counties in Nonattainment Status in the Study Area
Illinois	Illinois Environmental Protection Agency Bureau of Air	• Cook – 8-Hour Ozone (2015) • DuPage – 8-Hour Ozone (2015) • Grundy – 8-Hour Ozone (2015) • Kane – 8-Hour Ozone (2015) • Kendall – 8-Hour Ozone (2015) • Lake – 8-Hour Ozone (2015) • Madison – Sulfur Dioxide (2010) and 8-Hour Ozone (2015) • McHenry – 8-Hour Ozone (2015) • Monroe – 8-Hour Ozone (2015) • St. Clair – 8-Hour Ozone (2015) • Will – 8-Hour Ozone (2015)
Indiana	Indiana Department of Environmental Management Office of Air Quality	• Huntington – Sulfur Dioxide (2010) • Lake – 8-Hour Ozone (2015) • Porter – 8-Hour Ozone (2015)
Michigan	Michigan Department of Environment, Great Lakes, and Energy	• Allegan – 8-Hour Ozone (2015) • Berrien – 8-Hour Ozone (2015) • Muskegon – 8-Hour Ozone (2015) • St. Clair – Sulfur Dioxide (2010) • Wayne – Sulfur Dioxide (2010)
Minnesota	Minnesota Pollution Control Agency	• Dakota – Lead (2008)
Ohio	Ohio Environmental Protection Agency Division of Air Pollution Control	• Cuyahoga – 8-Hour Ozone (2015) • Geauga – 8-Hour Ozone (2015) • Lake – 8-Hour Ozone (2015) • Lorain – 8-Hour Ozone (2015) • Medina – 8-Hour Ozone (2015) • Morgan – Sulfur Dioxide (2010) • Portage – 8-Hour Ozone (2015) • Stark – Lead (2008) • Summit – 8-Hour Ozone (2015) • Washington – Sulfur Dioxide (2010)
Wisconsin	Wisconsin Department of Natural Resources	• Kenosha – 8-Hour Ozone (2015) • Milwaukee – 8-Hour Ozone (2015) • Ozaukee – 8-Hour Ozone (2015) • Racine – 8-Hour Ozone (2015) • Sheboygan – 8-Hour Ozone (2015) • Washington – 8-Hour Ozone (2015) • Waukesha – 8-Hour Ozone (2015)

Source: EPA 2024d

Alternative 1 – No Action

Under the No Action alternative, some communities may implement minor measures, but they would not constitute the same level of duration or organization as the Proposed Action described in this PEA. Therefore, there may be minor, short-term, adverse impacts from vehicle and equipment emissions at project sites. The minor measures would reduce flooding, but not to the level of the Proposed Action. Continued flooding could cause damage to facilities, structures, and infrastructure, that would require repair work. Repair work would result in minor, temporary increases in localized emissions from construction equipment and vehicles. Therefore, there would be periodic, minor, adverse impacts on air quality in the long term.

Alternative 2 – Proposed Action

The Proposed Action would result in temporary emissions from construction activities and use of vehicles and equipment with diesel and gasoline engines. During the construction phase, exposed soil could temporarily increase airborne PM into the project area from fugitive dust. Emissions from construction equipment could have minor, temporary effects on the levels of some pollutants, including CO, volatile organic compounds, NO_2, O_3, and PM. Local $PM_{2.5}$ and PM_{10} levels can increase during excavation of soils, demolition of concrete structures, and movement of vehicles on unpaved surfaces. Depending on the extent of the equipment and vehicle use, and with implementation of standard construction BMPs and compliance with current EPA emissions standards within the Construction Emission Control Checklist (**Appendix B**), and all other local, state, and federal regulations, there would be negligible to minor, short-term, adverse impacts on air quality.

Generally, activities would be expected to be below de minimis thresholds and would not increase emission levels of regulated air pollutants. However, some large projects, or those with longer construction periods, could involve more truck trips and longer durations of heavy equipment usage. Among other factors, the total volume of emissions is a function of the number and type of vehicles and equipment, the distance they are driven or hours per day they are operated, and the number of trips each makes or the duration of the project. Before applying the PEA to a specific project, consideration should be given about whether completing a conformity analysis is necessary, particularly for project areas in nonattainment areas. A conformity analysis would be conducted for any county in nonattainment status where construction emissions would contribute to the NAAQS pollutant for which the county is in nonattainment. If a project is found to exceed *de minimus,* an SEA may need to be prepared.

In general, no long-term adverse impacts on air quality are anticipated because the Proposed Action would not be a source of long-term air emissions. The Proposed Action would have minor, long-term benefits on air quality as it would reduce the need for flood-related repairs and the associated emissions generated during repairs. If a project would result in a new long-term source of air pollutants, an SEA may need to be prepared. Additionally, protecting infrastructure from flooding would have beneficial effects consistent with the following PR&G principals: healthy and resilient ecosystems, sustainable economic development, and public safety (**Appendix A**).

4.2.6. Coastal Resources

Congress passed the Coastal Zone Management Act (CZMA) in 1972 to preserve, protect, develop, and, where possible, restore or enhance the resources of the nation's coastal zone. Section 307 of the CZMA requires federal agencies' actions, within or outside the coastal zone, to be consistent with enforceable policies of a state's federally approved Coastal Zone Management Program (CZMP) (NOAA 2024a). Projects receiving federal assistance must follow the procedures outlined in 15 C.F.R. §§ 930.90-930.101 for federal coastal zone consistency determinations.

The CZMA outlines three national programs, including the National CZMP, the National Estuarine Research Reserve System (Reserve System), and the Coastal and Estuarine Land Conservation Program (CELCP). The CZMP works to balance issues of competing land and water uses through state coastal management programs. The Reserve System is a series of field laboratories researching the overall function of estuaries and how humans are impacting them, and the CELCP provides matching funds to state and local governments to purchase threatened coastal and estuarine lands or obtain conservation easements (NOAA 2024b). Projects occurring on federal lands within the Reserve System or funded by CELCP would not be eligible for FEMA funding.

The CZMA provides a partnership between states and NOAA to implement state-specific CZMPs. The CZMPs provide technical assistance and strategic grant funding to assist coastal communities in understanding risks and to mitigate coastal hazards, as well as to create and support resilient and sustainable coastal economies.

Each state covered in this PEA has federally approved CZMPs with missions to protect property and ecologically important habitats along the coastal shoreline and to minimize the dangers of erosion to human life and development. The programs may include setback regulations for building along the coastal shoreline that account for local erosion rates. Following is a summary of each state's CZMP:

Illinois: The Illinois DNR manages the Illinois CZMP, which protects and enhances the environmental, economic, and social values of the Illinois Great Lakes coastal region. The coastal zone–designated boundary generally follows watershed boundaries but is based in some areas on regional transportation networks such as roads, streets, highways, and railroads that provide an easily recognizable boundary. The Illinois CZMP has four primary goals: (1) protecting and improving coastal habitats, (2) supporting and facilitating resource-related coastal economic development, (3) helping coastal communities improve their capacity to protect natural, and economic resources, and (4) improving, refining, and administering the CZMP to provide the most effective and responsive implementation of coastal resource management (Illinois DNR 2024a).

Indiana: The Indiana DNR manages the Indiana Lake Michigan CZMP, which protects and enhances coastal resources by providing technical and financial assistance and coordination to current and future partners. The coastal zone–designated boundary is generally defined by watershed boundaries as well as practical landmarks, and ranges from a minimum of 2 miles from the shoreline to a maximum of 17 miles from the shoreline. The CZMP's goals and objectives include (1) informing coastal decision-makers about coastal resources, issues, and values, (2) ensuring that the program's resources are used for planning and implementing projects that will restore and protect

coastal areas, and (3) helping partners take action by sharing information and guidance (Indiana DNR 2024a).

Michigan: The Michigan EGLE Office of Coastal Management manages the Michigan CZMP, which protects and enhances coastal resources. The coastal zone boundary in Michigan generally includes the areas within a minimum of 1,000 feet of Lakes Michigan, Superior, Huron, and Erie, their connecting channels, all waters and bottomlands of Michigan's Great Lakes and connecting channels, and islands in those waters. The inland boundary extent varies in some locations to appropriately accommodate coastal resources such as coastal lakes, river mouths and embayments, floodplains, wetlands, dunes, urban areas, public parks, and other recreation/natural areas (EGLE 2017). The current objectives of the CZMP include (1) providing increased assistance at the state and local levels for creative solutions to coastal issues and problems, (2) minimizing program duplication and conflict, (3) improving enforcement and streamlining permit processes, and (4) providing opportunities for citizens and other public and private interests to become involved in coastal management (EGLE 2019; 2020).

Minnesota: The Minnesota DNR manages the operation of the Lake Superior CZMP, which provides technical and financial resources for the local community to preserve, protect, develop, and, where possible, restore or enhance coastal resources along Minnesota's North Shore of Lake Superior. The Minnesota coastal boundary follows the nearest legal coastal township along the shore, or approximately 6 miles inland. In the metropolitan area around Duluth, the coastal area fully encapsulates the cities of Duluth, Hermantown, Proctor, Carlton, Wrenshall, and Cloquet (Minnesota DNR 1999).

Ohio: The Ohio DNR Office of Coastal Management manages the Ohio CZMP, which enacts policies for Ohio's portion of Lake Erie, the shore, and adjacent watersheds to preserve, protect, develop, restore, and enhance coastal resources. The Ohio coastal zone includes all shorelands subject to erosion or flooding, estuarine areas and wetlands, and other areas in which activities would have the potential to affect Lake Erie directly and significantly. The inland extent of the boundary varies based on the biogeographic features of the area. The CZMP identifies six areas of strategic emphasis to guide program initiatives and activities: (1) water resources and watersheds, (2) coastal land use and development, (3) coastal habitat, wetlands, and natural areas, (4) coastal flooding and erosion, (5) recreational opportunities, and (6) fisheries and wildlife resources (Ohio DNR 2007).

Wisconsin: The Wisconsin Department of Administration manages the Wisconsin CZMP, which preserves, protects, develops, and restores or enhances the coastal resources in Wisconsin. The Wisconsin coastal zone includes the areas from the state boundary landward to the inland boundary of the 15 counties with frontage on Lake Superior, Lake Michigan, and Green Bay. The CZMP's objectives include (1) improving implementation and enforcement of existing state regulatory and management policies and programs affecting coastal uses and areas, (2) improving the coordination of existing policies and activities of governmental units and planning agencies on matters affecting key coastal uses and areas, (3) strengthening local government capabilities to initiate and continue effective coastal management consistent with identified state standards and criteria, (4) providing a strong voice to advocate for the wise and balanced use of the coastal environment, and

(5) increasing public awareness and opportunities for citizens to participate in decisions affecting the Great Lakes resources (Wisconsin Department of Administration 2024).

Upgrades to existing infrastructure and construction of new flood control projects may occur within the coastal zones designated within each state. The condition and quality of the resource within any project area is expected to vary based on where the project would be located. The study area includes the full range of coastal conditions from natural, undisturbed areas to previously armored landscapes in urban settings. The various natural resources that can be found within the coastal zone (e.g., wetlands, soils, surface waters, vegetation) are described in other sections of this document. In general, coastal resources will vary greatly by state and by lake. For instance, coastal resources along Lake Superior are likely to be remote and undisturbed, whereas areas along Lake Erie and Lake Michigan are likely to be more urbanized with residential and commercial developments adjacent to shorelines.

Alternative 1 – No Action

Under the No Action alternative, some efforts to construct or repair flood control projects may be implemented, but they would occur without FEMA funding and may not provide the same level of protection as the Proposed Action. Therefore, there could be negligible to minor, short-term, adverse impacts on water quality in coastal zones from the construction of minor projects. Construction of minor flood control projects may also result in short-term road closures, which could have negligible to minor impacts on transportation and recreation access in coastal zones. Parts of the study area within coastal zones would still be subject to flooding resulting from the unmitigated effects if the minor flood protection projects are not connected or constructed in a coordinated fashion to provide protection across property boundaries or jurisdictional lines. As described previously, each of the states' CZMPs outlines several priorities, including reducing coastal hazards, supporting economic development and recreation, and improving water quality and wildlife habitat. The No Action alternative may not be consistent with state CZMPs because there would be no larger projects able to provide coordinated protection, restoration, or creation of coastal resources within the study area. Continued flooding within coastal zones could result in the loss of coastal resources by damaging infrastructure and impacting water quality, wildlife habitat, and fisheries (Section 4.3). Ongoing flooding may result in the closure of roadways or recreational facilities, which could impact recreational use of coastal zones. Therefore, the No Action alternative would have a negligible to minor, long-term, adverse impact on coastal resources, depending on specific site conditions, and the extent and duration of continued flooding.

Alternative 2 – Proposed Action

Projects within the coastal zone could result in negligible to minor, short-term, adverse impacts on coastal resources from construction activities. Any activities associated with the Proposed Action occurring in designated coastal zones would require consultation with the appropriate state agency responsible for implementing the relevant CZMP. Favorable determinations of consistency with the CZMA and compliance with state and federal permits would ensure that potential impacts on coastal resources would not exceed a moderate level. Potential temporary impacts during construction

include a reduction in water quality, disturbance of wildlife habitat, and/or slightly reduced access to recreational areas because of construction-related road closures.

As described in Section 4.2.2, the Proposed Action would reduce non-point source contamination from receding floodwaters, improving water quality within the floodplain and downstream of the project areas. Because floodwaters generally recede into streams and rivers, and many of the streams and rivers within the study area drain into coastal zones (or into other streams that themselves terminate in coastal zones), the improvements in water quality within streams and rivers in individual project areas are likely to result in improvements in water quality within coastal zones. Because implementation of the Proposed Action is expected to reduce impacts on coastal resources from continued flooding, the Proposed Action could also benefit wildlife habitats and fisheries in coastal zones. Additionally, reduced flooding in coastal zones could improve the reliability of access to existing recreational areas along the coast, which would benefit communities by providing increased recreational opportunities and tourism. Therefore, projects within and upstream of coastal zones are generally expected to have negligible to minor, beneficial effects on coastal resources in the study area. Benefits provided by the Proposed Action would support the goals and priorities outlined in many of the states' CZMPs. Projects found to be inconsistent with state CZM policies would require an SEA.

4.3. Biological Resources

4.3.1. Vegetation and Invasive Species

EO 13112, *Invasive Species*, 64 Fed. Reg. 6183 (Feb. 8, 1999), as amended by EO 13751, *Safeguarding the Nation from the Impacts of Invasive Species*, 81 Fed. Reg. 88609 (Dec. 8, 2016) requires federal agencies to prevent the introduction of invasive species and provide for their control to minimize the economic, ecological, and human health impacts caused by invasive species. EO 13112 defines invasive species as alien species whose introductions do or are likely to cause economic or environmental harm or harm to human health, including noxious weed plant species. Invasive plants can alter an area's diversity for both plant and animal life by dominating areas where they have become established and crowding out native vegetation (U.S. Forest Service 2024). Each state designates invasive species and has adopted regulations regarding the sale, spread, and control of invasive species. Specific measures vary by state and by species, but rules typically require invasive species to be removed or controlled when found.

Vegetation refers to all plants and trees that occur within the study area. Vegetation composition varies greatly between habitats and microhabitats depending on environmental conditions (including water availability, soil type, temperature, sunlight exposure, etc.). Because the study area encompasses areas that are prone to flooding, areas that have been protected from flooding, and upland areas, vegetation in the study area is expected to be dominated by species that can tolerate a wide variety of habitat conditions, ranging from xeric upland habitats to habitats that support saturated soils (i.e., riparian vegetation).

Upland habitats and vegetation within the study area will vary upon location. Large parts of the study area are used for agriculture or are developed and do not support native vegetation communities. Upland areas that support native vegetation within the study area include, but are not limited to, upland deciduous forests, coniferous forests, and prairies (Illinois DNR 2024b). Tree species that are likely to occur in upland habitats include white oak (*Quercus alba*), white pine (*Pinus strobus*), red oak (*Quercus rubra*), red maple (*Acer rubrum*), quaking aspen (*Populus tremoloides*), and shagbark hickory (*Carya ovata*) (Illinois DNR 2024b; Minnesota DNR 2024b). Non-forest upland species that are native to the study area may include big bluestem (*Andropogan gerardii*), Indian grass (*Sorghastrum nutans*), prairie dock (*Silphium terebinthinaceum*), compass plant (*Silphium laciniatum*), goldenrod (*Solidago juncea*), and black-eyed Susan (*Rudbeckia hirta*) (Illinois DNR 2024b; Minnesota DNR 2024b).

Riparian tree species likely to occur in the study area include willow (*Salix* spp.), river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), cottonwood (*Populus sect. Aigeiros*), hackberry (*Celtis occidentalis*), sweet gum (*Liquidambar styraciflua*), green ash (*Fraxinus pennsylvanica*), box elder (*Acer negundo*), and silver maple (*Acer saccharinum*) (Indiana Division of Fish and Wildlife 2004). Emergent herbaceous plants and grasses that are native to the study area include sweet flag (*Acorus calamus*), water plantain (*Alisma subcordatum*), river bulrush (*Scirpus fluviatus*), arrowhead (*Sagittaria latifolia*), big bluestem (*Andorpogon gerardii*), and bluejoint grass (*Calamagrostis canadensis*) (Lake County Stormwater Management Commission 2014).

Invasive plant species commonly found in the Midwest include autumn olive (*Elaeagnus umbellata*) Canada thistle (*Cirsium arvense*), Japanese stiltgrass (*Microstegium vimineum*), Japanese honeysuckle (*Lonicera japonica*), garlic mustard (*Alliaria petiolata*), buckthorn (*Rhamnus* spp.), reed canary grass (*Phalaris arundinacea*), phragmites (*Phragmites* spp.), tree-of-heaven (*Ailanthus altissima*), and more (Midwest Invasive Plant Network 2024; National Park Service [NPS] 2023a).

EPA has developed a system of ecoregions to inventory and assess national and regional environmental resources and to structure and implement ecosystem management strategies across federal agencies, state agencies, and nongovernmental organizations. Ecoregions are areas where the type, quality, and quantity of environmental resources are generally similar; they are identified by analyzing the patterns and composition of biotic and abiotic phenomena that affect or reflect differences in ecosystem quality (EPA 2023a). These ecoregions provide a high-level view of the vegetation and general ecosystem characteristics within their footprints. The study area overlaps 18 EPA-designated Level III ecoregions (**Figure 4-4** and **Table 4-4**).

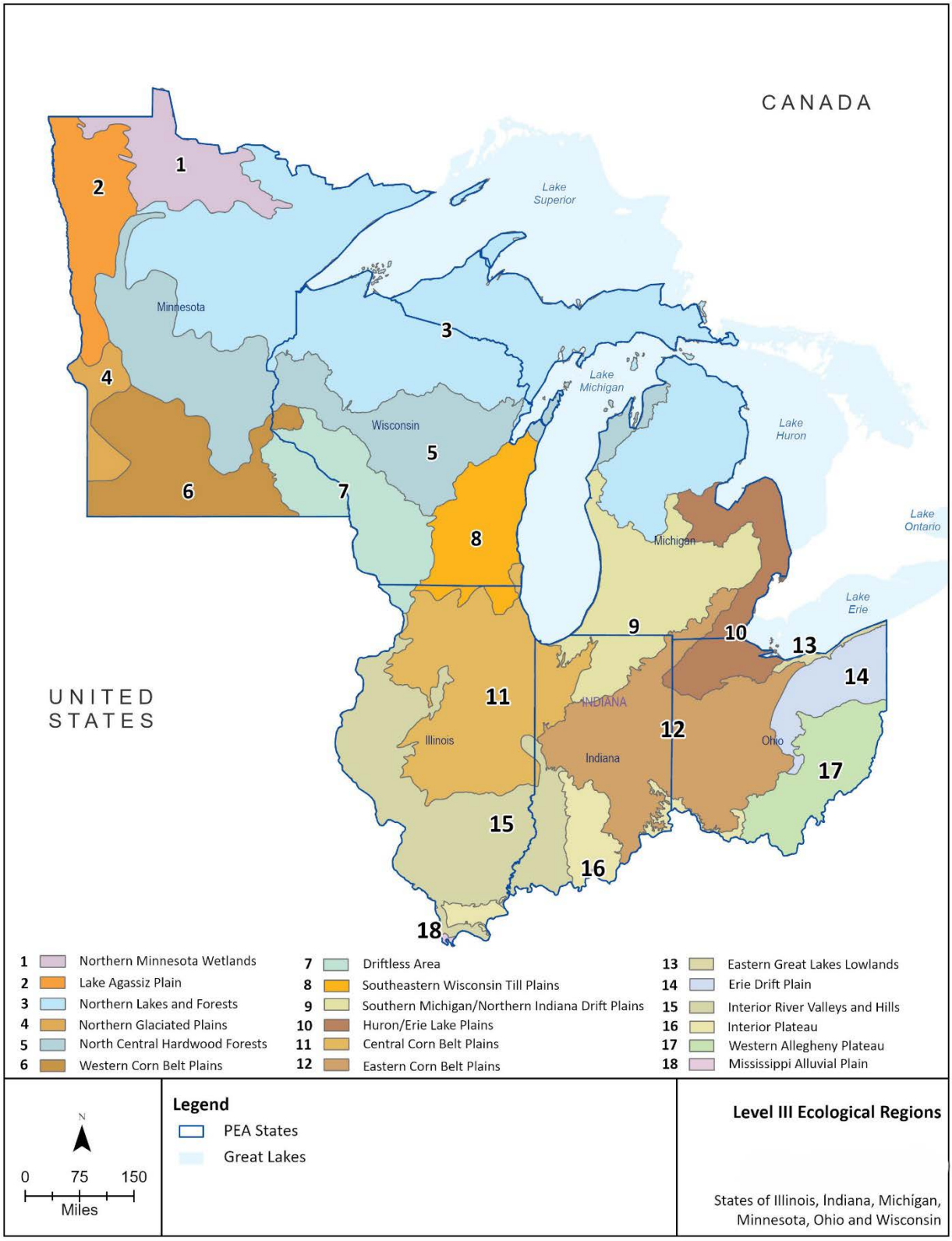

Figure 4-4. Level III Ecoregions

Table 4-4. Level III Ecoregions within the Study Area

Level III Ecoregion	State(s)	Area (Acres)	Percentage of Total Area	Description of Vegetation and Other Ecosystem Features
Northern Lakes and Forests	Michigan, Minnesota, Wisconsin	47,415,400	22.3	Characterized by coniferous and northern hardwood forests, morainal hills, broad lake basins, and extensive sandy outwash plains. Soils are relatively nutrient poor. Areas have lower annual temperatures and a shorter frost-free period than ecoregions to the south.
North Central Hardwood Forests	Michigan, Minnesota, Wisconsin	21,970,023	10.3	Transitional area between the Northern Lakes and Forests ecoregion and the warmer, mostly agricultural ecoregions to the south. Land cover consists of a mosaic of forests, wetlands and lakes, cropland agriculture, pasture, and dairy operations. The topography ranges from nearly level to rolling Till Plains.
Eastern Corn Belt Plains	Indiana, Michigan, Ohio	21,462,957	10.1	Historically, this ecoregion was dominated by beech (*Fagus* spp.), maple (*Acer* spp.), and basswood (*Tilia americana*) forests. However, now this area is dominated by extensive corn (*Zea mays*), soybean (*Glycine max*), and livestock production.
Interior River Valleys and Hills	Illinois, Indiana	20,907,437	9.8	Natural vegetation likely included oak (*Quercus* spp.) – hickory (*Carya* spp.) forests, beech–maple forests, and bluestem prairies. Today, approximately 30 percent of the ecoregion is pastureland, less than half is cropland, and the rest is forest. Forests are typically found in steeper areas.
Central Corn Belt Plains	Illinois, Indiana, Wisconsin	18,905,973	8.9	While these areas were historically dominated by tallgrass prairies, the area is now dominated by extensive cropland and livestock farming. The main crops grown are corn and soybeans. Agriculture has affected stream chemistry, turbidity, and habitats in the ecoregion.

Level III Ecoregion	State(s)	Area (Acres)	Percentage of Total Area	Description of Vegetation and Other Ecosystem Features
Southern Michigan/ Northern Indiana Drift Plains	Indiana, Michigan	13,105,269	6.2	Vegetation comprises oak-hickory forests, northern swamp forests, and beech forests. Feed grain, soybean, and livestock farming are common. Woodlots, quarries, recreational developments, and urban-industrial areas are also common.
Western Corn Belt Plains	Minnesota, Wisconsin	10,777,948	5.1	Although historically dominated by tallgrass prairie, now more than 75 percent of this ecoregion is used for cropland agriculture, and much of the remaining area is in forage for livestock. Topography ranges from nearly level to gently rolling Till Plains and hilly loess plains. Fertile, warm, and moist soils support corn and soybean crops.
Driftless Area	Illinois, Minnesota, Wisconsin	9,925,051	4.7	Topography in this ecoregion is hilly, differentiating it from the surrounding ecoregions. Land cover includes agriculture within the upland areas and oak forests and savannas, prairie grassland areas, and sugar maple (*Acer saccharum*)-basswood-oak forests.
Huron/Erie Lake Plains	Indiana, Michigan, Ohio	7,807,234	3.7	Historically, vegetation was dominated by elm (*Ulmus* spp.)–ash (*Fraxinus* spp.) swamp and beech forests. Now, much of the area has been cleared and artificially drained and supports crops including corn, soybeans, and other vegetables. Urban and industrial areas are also extensive.
Southeastern Wisconsin Till Plains	Illinois, Wisconsin	7,746,839	3.6	This ecoregion historically supported a diversity of vegetation types including oak savanna, bluestem prairie, maple-basswood forest, and oak-hickory forest. Currently, more than half the ecoregion is used for agriculture and the remaining areas comprise forests, wetlands, and residential developments.

Level III Ecoregion	State(s)	Area (Acres)	Percentage of Total Area	Description of Vegetation and Other Ecosystem Features
Western Allegheny Plateau	Ohio	7,604,318	3.6	Topography within this ecoregion is hilly, and vegetation is dominated by mixed mesophytic forests and mixed oak forests. Although the ecoregion is still dominated by forest vegetation, some land within it has been converted for dairy, livestock, general farm, and residential use.
Lake Agassiz Plain	Minnesota	6,608,790	3.1	Areas historically dominated by tallgrass prairie within this ecoregion have been replaced by agriculture lands supporting corn, soybeans, and sugar beets (*Beta vulgaris ssp. vulgaris*). Topography in this ecoregion is relatively flat.
Northern Minnesota Wetlands	Minnesota	5,641,178	2.7	Topography within this ecoregion is nearly level. This ecoregion is sparsely inhabited by humans and is dominated by conifer bog, mixed forest, and boreal forest ecosystems. Formerly dominated by broad glacial lakes, much of this ecoregion is still inundated with standing water.
Interior Plateau	Illinois, Indiana, Ohio	5,083,320	2.4	Dominated by oak-hickory forest. The topography is characterized by rugged hills that contain bluffs, ravines, and karst features. Pastureland, hayland, limestone glades, and some cropland also occurs within portions of the ecoregion.
Erie Drift Plain	Ohio	4,979,164	2.3	Land cover within this ecoregion comprises urban and industrial development, agriculture, and some scattered woodlands. Terrain ranges from level to rolling hills. Soils are generally lower in carbonate and less fertile than other glaciated ecoregions. Lakes, wetlands, and swampy streams occur in flat, clayey portions of the ecoregion.
Northern Glaciated Plains	Minnesota	2,268,300	1.1	Characterized by a flat to gently rolling landscape. Soils are fertile, but agricultural success is subject to annual climatic variations. The land cover is dominated by corn and soybeans, and the remaining areas are dominated by pastureland and grassland.

Level III Ecoregion	State(s)	Area (Acres)	Percentage of Total Area	Description of Vegetation and Other Ecosystem Features
Eastern Great Lakes Lowlands	Ohio	423,423	0.2	Land cover includes orchards, vineyards, and vegetable farming as well as dairy operations. The portion of this ecoregion in Ohio experiences an increased growing season, more winter cloudiness, and greater snowfall than the portions of this ecoregion in Pennsylvania.
Mississippi Alluvial Plain	Illinois	74,527	0.0	Characterized by a nearly flat alluvial plain that extends along the Mississippi River from southern Illinois to the Gulf of Mexico. Although previously dominated by bottomland deciduous forests and swamps, the ecoregion has been mostly cleared for cultivation, and now cropland is the dominant land cover type. Soybeans, corn, and wheat (*Triticum aestivum*) are the main crops grown in the ecoregion.

Source: EPA 2023a

Alternative 1 – No Action

Under the No Action alternative, minor flood protection projects within the study area may occur. These activities could cause a minor to moderate, short-term, adverse impacts on vegetation from ground disturbance and possible vegetation disturbance and removal, which could alter the composition of the vegetative community and result in the introduction or spread of invasive species.

Because the risk of flooding in the study area would not be substantially abated under the No Action alternative, the continued loss of soils from periodic flooding could result in the loss of existing vegetation established in those soils or a reduction in the availability of suitable habitat for vegetation to colonize. The deposition of flood-carried sediment could result in the loss of wetland and riparian vegetation, and the exposed soils could create conditions conducive to colonization by invasive plant species, which typically thrive in disturbed areas. Therefore, the No Action alternative would have negligible to minor, long-term, adverse impacts, depending on the local extent of erosion, vegetation loss, and spread of invasive species.

Alternative 2 – Proposed Action

Flood protection projects implemented under the Proposed Action would have minor to moderate, short-term, adverse impacts on vegetation during and immediately following construction. Equipment and vehicles used during construction could disturb or remove vegetation and compact soils. The removal of upland vegetation could result in disturbed soils that are more prone to erosion and colonization by invasive species. In addition, removal of riparian vegetation could result in stream banks becoming destabilized, which could increase the potential for erosion. Furthermore, temporarily disturbed areas would be reseeded or replanted with native vegetation to mitigate any long-term impacts from construction disturbance. Project work would adhere to the respective project's state-invasive species management plan or regulations when applicable.

In the long term, flood protection projects are expected to reduce flooding and associated impacts, such as erosion, that result in the deposit of sediments across upland areas and within waterways. Additionally, the reduction in flood-related erosion would prevent some vegetated areas from becoming disturbed, lessening the chances for invasive species to become established. Furthermore, as described in Section 4.2.3, reducing flooding would also improve water quality throughout the study area, which would have a beneficial impact on vegetation communities. Projects under the Proposed Action would remove non-native invasive plants from project areas when practicable and would revegetate using local plant species whose roots and ground coverage would prevent erosion of topsoil. Therefore, the Proposed Action would have long-term, negligible to minor, beneficial effects on vegetation in the study area. Further, the beneficial effects on water quality and ecosystems would be consistent with the PR&G guiding principles, as outlined in **Appendix A**.

4.3.2. Fish and Wildlife

Fish and wildlife include any species that occupies, breeds, forages, rears, rests, hibernates, or migrates through the study area. Regulations relevant to fish and wildlife include EO 13112 (*Invasive Species*), the Bald and Golden Eagle Protection Act (BGEPA), and the Migratory Bird Treaty Act (MBTA). Section 4.3.3 evaluates threatened and endangered species under the Endangered Species Act (ESA).

The MBTA of 1918, as amended, 16 U.S.C. §§ 703 through 712, protects migratory birds and their nests, eggs, and body parts from harm, sale, or other injurious actions. All native birds, including common species, are protected by the MBTA. A migratory bird is any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle. Projects likely to result in the purposeful taking of birds protected under the MBTA would require the issuance of permits from the USFWS. The nesting season for migratory birds in the Great Lakes region is generally spring to fall.

The BGEPA of 1940, 16 U.S.C. §§ 668 *et seq.*, prohibits the take, possession, sale, or other harmful action of any golden eagle (*Aquila chrysaetos*) or bald eagle (*Haliaeetus leucocephalus*), alive or dead, including any part, nest, or egg (16 U.S.C. § 668[a]). The BGEPA requires consultation with USFWS to ensure that proposed federal actions do not adversely affect bald or golden eagles. Project activities may be required to avoid certain seasons or buffer areas around nesting eagles and may need to be issued permits from the USFWS based on likelihood of take.

As described in Section 4.3.1, EO 13112 (*Invasive Species*) requires federal agencies to prevent the introduction of invasive plant and animal species and provide for their control to minimize the economic, ecological, and human health impacts that invasive species cause. Each state designates invasive species and has adopted regulations regarding the sale, spread, and control of invasive species.

Flood control projects, including levees and floodwalls would be constructed in upland, terrestrial habitats and may affect aquatic habitats as well. Therefore, the study area includes both terrestrial and aquatic habitats that have potential to support a diversity of fish and wildlife species. Following are the descriptions of the terrestrial and aquatic resources that are expected to occur within the study area.

Terrestrial habitat resources within the study area include natural and disturbed habitats. Section 4.3.1 describes the typical vegetation found within the study area. Although much of the study area and surrounding areas have been developed, a diversity of wildlife species persists in both the developed and more natural terrestrial environments within the study area. Hundreds of bird species occur within the study area; common species include the white-throated sparrow (*Zonotrichia albicollis*), red-winged blackbird (*Agelaius phoeniceus*), mourning dove (*Zenaida macroura*), hairy woodpecker (*Leuconotopicus villosus*), eastern bluebird (*Sialia sialis*), great blue heron (*Ardea herodias*), and red-shouldered hawk (*Buteo lineatus*) (Indiana Audubon 2022; Audubon Great Lakes 2024; iNaturalist 2024). As mentioned in Section 4.3.2, MBTA protects all native birds, including common species.

Common mammals expected to occur within the terrestrial portions of the study area include the eastern gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), white-tailed deer (*Odocoileus virginianus*), striped skunk (*Mephitis mephitis*), eastern cottontail (Sylvilagus floridanus), gray fox (*Urocyon cinereoargenteus*), and little brown bat (*Myotis lucifugus*) (Michigan DNR 2024b; Minnesota DNR 2024c; Ohio DNR 2024b). As mentioned previously, bald eagles also have potential to breed in the study area. Additionally, many of the reptiles, amphibians, mammals, and birds also use and require suitable terrestrial habitat adjacent to aquatic habitats.

Bald eagles require habitats that have perching areas and nesting sites and that support an adequate prey base. Bald eagles often occur near estuaries, large lakes, reservoirs, and rivers, though they are increasingly being found in drier areas that are farther from water sources, such as in farmlands and suburban and urban habitats (USFWS 2024a). Bald eagles have moderate potential to occur within and adjacent to the study area, based on a review of recent occurrence data and the general habitat conditions within the study area (Cornell Lab of Ornithology 2024a). Golden eagles are typically found in areas of open land near hills, cliffs, and bluffs. Golden eagles are known to be sensitive to human activity and tend to avoid more developed areas. A review of species occurrence data indicates that golden eagles have low to moderate potential to occur within portions of the study area that provide suitable habitat (Cornell Lab of Ornithology 2024b). Bald eagles occur year-round and breed within the study area, while golden eagles migrate through and overwinter in the study area.

Terrestrial invasive species of concern within the study area include the mountain pine beetle (*Dendroctonus ponderosae*), feral pigs (*Sus scrofa*), jumping worms (*Amynthas agrestis*), emerald ash borer (*Agrilus planipennis*), Asian long-horned beetle (*Anoplophora glabripennis*), and spotted lanternfly (*Lycorma delicatula*) (Indiana DNR 2024c; WDNR 2015; Michigan Invasive Species 2024).

Aquatic habitat resources in the study area include freshwater rivers, streams, wetlands, lakes, and ponds. More than 100 fish species, including sturgeon (*Acipenseridae*), lampreys (*Petromyzontidae*), carps and minnows (*Cyprinidae*), and trout and salmon (*Salmonidae*) occur within the study area and the abutting Great Lakes. Common species include largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), crappie (*Pomoxis* spp.), bluegill (*Lepomis macrochirus*), and steelhead (*Oncorhynchus mykiss*) (Illinois Natural History Survey 2021; Indiana DNR 2024b; Michigan DNR 2024a; Minnesota DNR 2024a; Ohio DNR 2024a; WDNR 2024). Freshwater mollusks, including mussels, clams, and snails, are also found within the study area. Common reptiles and amphibians that may use aquatic habitats in the study area include the painted turtle (*Chrysemys picta*), northern water snake (*Nerodia sipedon*), American toad (*Anaxyrus americanus*), common garter snake (*Thamnophis sirtalis*), American bullfrog (*Lithobates catebeianus*), green frog (*Lithobates clamitans*), eastern red-backed salamander (*Plethodon cinereus*), and wood frog (*Lithobates sylvaticus*) (iNaturalist 2024). Mammals, including river otters (*Lontra canadensis*) and muskrats (*Ondatra zibethicus*), also may use aquatic habitats within the study area, as well as birds such as mallards (*Anas platyrhynchos*) and Canada geese (*Branta canadensis*) (iNaturalist 2024). Section 4.3.3 discusses the listed threatened and endangered species that may use aquatic habitats within the study area.

Aquatic invasive species of concern include zebra mussels (*Dreissana polymorpha*), Chinese mystery snail (*Cipangopaludina chinensis*), Asiatic clam (*Corbicula fluminea*), and marbled crayfish (*Procambarus virginalis*) (Indiana DNR 2024c; WDNR 2015; Michigan Invasive Species 2024).

Alternative 1 – No Action

Because some minor flood protection projects may occur under the No Action alternative, there could be some negligible to minor, short-term, adverse impacts on fish and wildlife species (including migratory birds and eagles) from construction-related noise, vibration, ground disturbance, and vegetation removal. These impacts could result in temporary habitat loss, changes in individuals' behavior, and/or mortality or injury of individuals present during construction work. Implementation of minor flood protection projects without systematic coordination could result in a larger number of piecemeal projects; therefore, there is a greater frequency of disturbances associated with construction and maintenance that might affect multiple breeding seasons as compared to a larger coordinated project that might affect only one or two breeding seasons. Any minor flood mitigation measures implemented would likely occur in or near developed areas. Thus, any fish and wildlife species (including migratory birds and eagles) choosing to inhabit project areas are likely to be somewhat acclimated to human noise and activities. However, because existing habitat is already scarce in developed areas, even small disturbances within available habitat may result in adverse effects on wildlife species occupying it.

In the long term, flooding would not be substantially mitigated, which would continue to allow pollutants and sediments to enter aquatic habitats, reducing water quality within and near the study area. Reduced water quality could adversely affect fish, freshwater mollusks, and other taxa that rely on aquatic habitats. Additionally, continued erosion and sediment deposit in upland areas could create disturbed areas that may be more readily colonized by invasive species as described in Section 4.3.1, resulting in reduced species diversity and habitat conditions that are generally less suitable for many wildlife species. Therefore, the No Action alternative is expected to have minor to moderate, long-term, adverse impacts on fish and wildlife species reliant on the aquatic and terrestrial habitats in the study area.

Alternative 2 – Proposed Action

During construction, the use of vehicles and equipment could result in the injury or death of individuals present during project implementation, resulting in minor to moderate, short-term, adverse impacts on fish and wildlife. However, implementing appropriate measures when deemed necessary could reduce the potential for harm. Project-related disturbances could result in altered or disrupted foraging, breeding, or resting behaviors that could affect the health of species and populations. However, the duration of each flood control project activity in any one location would be limited. Additionally, the purpose of FEMA-funded projects is to protect infrastructure; therefore, flood control projects that would be implemented under the Proposed Action are likely to occur in or near developed areas. Any fish and wildlife species (including migratory birds and eagles) choosing to inhabit project areas are likely to be somewhat acclimated to human noise and activities. However, because existing habitat is already scarce in developed areas, even small construction disturbances within available habitat may result in adverse effects on wildlife species.

Work to construct or repair flood control projects would adhere to the respective project's state-invasive species management plan or regulations when applicable. Should a project require in-water work, impacts on aquatic species may be minimized or mitigated by seasonal restrictions for in-water work as well as adherence to any relevant conditions prescribed in project-specific permits or agency consultations.

Use of motorized vehicles and equipment during a project could have minor impacts on nesting birds protected by the MBTA. Projects that involve vegetation removal have a greater potential to adversely affect nesting migratory birds. Projects would have minor to moderate, short-term, adverse impacts on nesting migratory birds if vegetation removal work were to occur during nesting seasons. Should a project need to be conducted during the migratory bird nesting season, coordination with USFWS may be required to determine adequate mitigation and avoidance measures to reduce impact on MBTA species and to obtain any necessary take permits.

If bald or golden eagle nests or roost sites are identified in a project area, consultation with USFWS would be required to establish appropriate buffers and actions to protect sites. The subapplicant would be responsible for obtaining an eagle disturbance permit if necessary. Typical mitigation measures include establishing seasonal limits on vegetation clearing activities, retaining nest trees, moving nest trees if possible, establishing buffers around nest trees or roosts, and implementing the USFWS Bald Eagle Management Guidelines.

Construction and repair of earthen levees and floodwalls would likely require vegetation removal that would result in long-term impacts through the loss of habitat for wildlife species. Although many projects under the Proposed Action would require disturbed areas to be replanted, they would still result in a loss of habitat until the replacement vegetation becomes established and matures, which could be many years. Further, both earthen levees and floodwalls would require continued maintenance, and areas along the project alignments may be routinely mowed, which would not create suitable habitat for many species. However, projects may replace non-native or invasive vegetation with native plant species that have higher value as wildlife habitat in the long term. Additionally, implementation of projects under the Proposed Action would reduce the occurrence of future flooding within the project area, which would improve water quality within aquatic habitats (Section 4.2.2) and improve terrestrial habitats by allowing native plants to establish and persist in areas that were prone to flood-related erosion (Section 4.3.1). Therefore, the Proposed Action would improve aquatic and terrestrial habitats in the long term and result in minor to moderate, beneficial effects on fish and wildlife that rely on those habitats.

4.3.3. Threatened and Endangered Species and Critical Habitat

The Endangered Species Act (ESA) of 1973, 16 U.S.C. §§ 1531 through 1544, provides a framework for the conservation of endangered and threatened species and their habitats. The lead federal agencies for implementing the ESA are USFWS and National Marine Fisheries Service (NMFS). Federal agencies are required to ensure that actions they fund, authorize, or carry out are not likely to jeopardize the continued existence of any listed species (including plant species) or result in the destruction or adverse modification of designated critical habitats for such species. The ESA also

prohibits any action that causes a "take" of any listed species. The term "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or to attempt to engage in any such conduct."

Based on a review of the USFWS Information for Planning and Consultation tool conducted in June 2024, there are 63 federally listed species, 3 species proposed for listing, and 1 candidate species that have the potential to occur within the states covered by this PEA, as summarized in **Appendix C** (USFWS 2024c). Of these 67 listed, proposed, and candidate species (hence forth referred to as "listed species"), 6 are mammals, 4 are birds, 3 are reptiles, 2 are fish, 20 are clams, 1 is a snail, 9 are insects, 1 is a crustacean, 20 are flowering plants, and 1 is a fern (**Appendix C**; USFWS 2024c). All federally listed, proposed, and candidate species with the potential to occur in the study area are under USFWS's jurisdiction; no federally listed species under NMFS's jurisdiction have potential to occur in the study area (NMFS 2022). The study area overlaps designated critical habitat areas for 12 species, as summarized in **Appendix C**.

Alternative 1 – No Action

Under the No Action alternative, minor flood control projects could have adverse effects on listed species and their habitats through construction activities. Construction work to reduce flood hazards may cause noise, vibration, vegetation removal, or disturbance. Additionally, construction activities may cause increased erosion in upland areas and sedimentation in waterways. Noise disturbances may disrupt the normal behaviors of listed wildlife species, resulting in reduced fitness or death (e.g., if a species is unable to escape the noise or is driven into unsuitable or unfamiliar habitats where they are eaten by other species). Therefore, these minor mitigation projects could result in negligible to moderate, short-term, adverse effects on federally listed species or designated critical habitat.

In the long term, the No Action alternative would not substantially mitigate flooding. Flooding within occupied habitats can displace listed species from their preferred habitats and home ranges. During flood events, listed fish species may leave a river or stream and become stranded in upland areas. When floodwaters recede, stranded fish would suffocate. Flooding within occupied terrestrial habitats could cause fatalities of listed species through the drowning of individuals (e.g., burrowing mammals, ground nesting birds) that cannot relocate to higher ground. Ongoing flooding could increase erosion in upland areas, causing sedimentation and turbidity within nearby waterways, which may impair the quality and availability of suitable habitat or designated critical habitat for listed aquatic species within and downstream of project areas. Extended flooding of terrestrial habitat and oversaturation of soil would create unsuitable habitat for plant species outside of riparian communities. Erosion caused by flooding and pollutants left after floodwaters recede could reduce the amount of suitable terrestrial habitat and designated critical habitat for listed terrestrial species including plants. Areas disturbed by flooding and erosion are more prone to be readily colonized by invasive plant species, which may outcompete listed plants and reduce the quality of terrestrial habitat for other listed species. Therefore, the No Action alternative would have minor to moderate, long-term, adverse impacts on federally listed species and designated critical habitat from continued flooding.

Alternative 2 – Proposed Action

Flood mitigation projects implemented under the Proposed Action have the potential to affect listed species and designated critical habitat, because federally listed species and their habitats are expected to be subject to the same impacts as those described in Sections 4.3.1 and 4.3.2. Although the magnitude of the potential effects is expected to vary based on specific project activities and locations, FEMA expects that short-term impacts would not exceed moderate levels because construction activities would be limited by permit conditions and any recommendations from USFWS resulting from informal or formal consultation. In the long-term, FEMA expects that projects would result in minor to moderate benefits on listed species from the reduced risk of flooding, as discussed in Sections 4.3.1 and 4.3.2.

Before implementing any project under the Proposed Action, FEMA would analyze the project location, habitat conditions, USFWS's Information for Planning and Consultation tool, and any available and relevant natural heritage database information. Based on the review, FEMA would determine whether there is a potential for the project to affect federally listed species or designated critical habitat.

FEMA would consult with USFWS under Section 7(a)(2) of the ESA for all projects that may affect listed species or designated critical habitat, including newly listed species and critical habitat that were not originally summarized in Appendix B of the PEA, and would seek concurrence with findings of *not likely to adversely affect,* or conduct a formal consultation for findings of *likely to adversely affect.* If a proposed project is *likely to adversely affect* a federally listed species, issuance of a biological opinion and incidental take permit by USFWS would be required before project implementation. A tiered SEA would need to be developed for any proposed projects with findings of *may affect, likely to adversely affect.*

Threatened and endangered species are expected to be subject to the same project-specific impacts as other fish and wildlife species; therefore, the impact evaluations for the common scope of work and specific projects provided in Section 4.3.2 are expected to apply to federally listed species as well.

4.4. Socioeconomics

4.4.1. Hazardous Materials

Hazardous materials and wastes are regulated under several federal laws, including 40 C.F.R. Part 260; the Resource Conservation and Recovery Act (RCRA) of 1976; the Solid Waste Act; the Toxic Substances Control Act; the Comprehensive Environmental Response, Compensation, and Liability Act as amended by the Superfund Amendments and Reauthorization Act; and the CAA of 1970. Occupational Safety and Health Administration standards under the Occupational Safety and Health Act seek to minimize adverse impacts on worker health and safety (29 C.F.R. Part 1926). Evaluating hazardous substances and wastes includes consideration of whether any hazardous material would be generated by the proposed activity or already exists at or in the general vicinity of the site (40 C.F.R. § 312.20).

Table 4-5 provides the number of Superfund sites, brownfield sites, Toxic Release Inventory sites, and RCRA corrective action sites in each state within the study area.

Table 4-5. Hazardous Materials Sites within the Study Area by State

State	State Regulatory Agency	National Priorities List (Superfund Program)	Brownfield Sites	Toxic Release Inventory Sites	RCRA Corrective Action Sites
Illinois	Illinois Environmental Protection Agency	63	1,382	3,149	38,642
Indiana	Indiana Department of Homeland Security	49	1,294	2,520	16,815
Michigan	Michigan Department of Environment, Great Lakes, and Energy	69	3,269	2,337	44,066
Minnesota	Minnesota Pollution Control Agency	24	844	1,319	41,110
Ohio	Ohio Environmental Protection Agency	41	1,407	3,712	32,781
Wisconsin	Wisconsin Department of Natural Resources	37	987	2,104	23,801

Source: EPA 2024e

Alternative 1 – No Action

Under the No Action alternative, construction activities from minor mitigation projects would introduce the risk of oil and fuel leaks from equipment and the potential use or exposure of contaminated fill and materials. However, minor mitigation projects would be required to conform to local, state, and federal regulations and standards. Equipment would be inspected to monitor for leaks and stored at the appropriate staging areas. Any fill used would need to be contaminant-free and properly permitted under Section 404 of the CWA. Therefore, construction of minor measures would have a negligible to minor adverse impact from hazardous materials. In the long term, flooding would not be substantially mitigated and could continue to threaten exposure of hazardous material sites, including hazardous waste storage facilities, or release hazardous materials into the environment within or near the study area. Floodwaters could spread contaminated materials at hazardous material sites, which could lead to the contamination of soil and water in the project area and vicinity. Therefore, there could be negligible to moderate, long-term, adverse impacts from hazardous materials.

Alternative 2 – Proposed Action

During construction, there would be a minor risk of leaks of oils, fuels, and lubricants from construction equipment. Any fill brought in from outside the project site would need to come from a licensed or permitted source and would be free of contaminants. There is also a potential for construction to expose unknown contaminated materials because of excavation and removal of soil and construction debris from the project area. FEMA would review the databases of known contaminated sites during project reviews to confirm that there would not be more than a minor potential for people and the environment to be exposed to hazardous materials. In addition, the project would have to conform to local, state, and federal regulations and standards. With the implementation of the following BMPs, the Proposed Action would have negligible to minor, short-term, adverse impact related to hazardous materials.

- Any hazardous and contaminated materials discovered, generated, or used during construction of the Proposed Action would be disposed of and handled by the subapplicant in accordance with applicable federal, state, and local regulations. If a Phase I or II environmental site assessment indicates that contamination exceeding reporting levels is present and further action is warranted, an SEA would be required.

- Construction equipment would be kept in proper working order. Any equipment to be used above, in, or within 100 feet of water would be inspected daily for fuel and fluid leaks consistent with 29 C.F.R. 1926.1412(d). Any leaks would be promptly contained and cleaned up, as required by 40 C.F.R. 450.21(d)(3), and the equipment would be repaired.

- Any imported fill used at the project site would meet state and local regulations for clean fill. Fill material discharged below the OHWM of a stream or into a wetland would require a Section 404 permit and must be free from hazardous materials, as determined by 40 C.F.R. 230.60(b).

- In the event of an inadvertent spill, the subapplicant must immediately contact the appropriate regulatory agency, or other contact listed on the subapplicant's NPDES permit, if applicable. State or local requirements that may necessitate reporting of spills or other prohibited discharges to local emergency response, public health, or drinking water supply agencies would also be followed.

The Proposed Action would construct levees and flood walls around structures that could include hazardous facilities and along waterbodies to provide protection from flood waters. Levees and floodwalls along waterbodies would reduce and potentially prevent flood waters from impacting nearby hazardous facility sites and structures and spreading contamination. Floodwalls and levees around structures, especially hazardous facilities, would protect the structures and facilities from flood and erosion related damage and potential spread of contamination. The Proposed Action would have long-term, minor to moderate, beneficial effects by protecting hazardous sites and facilities from flooding.

4.4.2. Land Use and Planning

Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin have implemented land-use planning laws that allow, but do not require, local governments to engage in long-term land-use planning.

Illinois allows every local planning commission and planning department to prepare comprehensive plans for the present and future development of the municipality. The plans may include reasonable requirements relating to rights-of-way, public grounds, and other improvements (65 Ill. Comp. Stat. § 5/11-12-5).

Indiana Code empowers local governments to adopt comprehensive plans that contain at least the three following elements: objectives for future development of the jurisdiction, policies for land use, and policies for development of public ways, places, lands, structures, and utilities. Additional comprehensive plan contents are outlined in Ind. Code § 36-7-4.

Michigan Planning Enabling Act (Act 33 of 2008) allows a local government to adopt, amend, and implement a master plan to guide and accomplish development that meets the criteria outlined in Section 125.3807, including development that is economical, harmonious, and efficient, and that promotes public health, safety, and general welfare (Mich. Comp. Laws § 25.3807).

Minnesota has granted county commissioner boards with the authority to prepare and adopt comprehensive plans by ordinance (Minn. Stat. § 394.23). Counties outside of a metropolitan area, with less than 80 percent of their pre-settlement wetland acreage intact, must consider adopting goals and objectives for the preservation of agricultural, forest, wildlife, and open space land, and minimize development in sensitive shoreline areas (Minn. Stat. § 394.231).

Ohio regional or county planning commissions may make plans, studies, maps, recommendations, and reports concerning the physical, environmental, social, economic, and governmental characteristics, functions, services, and other aspects of the region or county, respectively (Ohio Rev. Code § 713.23).

Wisconsin's Comprehensive Planning Law requires local public participation in deciding a vision for a community's future (Wisc. Stat. § 66.1001). The law requires communities to include certain elements in their plans and update their plans no less than once every 10 years. The law also provides flexibility for communities to address statutory requirements and drive the planning process.

According to the USGS National Landcover Database, the study area has a variety of land covers that encompass a wide range of land uses, including urban, residential, open space, recreational, agricultural, and natural areas, such as forests and wetlands. The top two land uses across all six states are agricultural and forested land (Dewitz and USGS 2021). Section 4.3.1 provides additional information on vegetation and landcover.

Alternative 1 – No Action

Under the No Action alternative, communities may implement minor mitigation measures. These measures likely would not change current land uses; however, because these minor measures would not effectively reduce flooding over a substantial area, they may not allow land-use plans to be fully implemented in the long term. The minor measures likely would not change the land use or zoning within the communities where these projects are implemented. Therefore, the No Action alternative may have negligible adverse impacts on land use and planning within communities in the project area from the implementation of minor actions.

Alternative 2 – Proposed Action

Construction of levees and floodwalls would support existing land uses by reducing flooding and flood impacts that otherwise would threaten structures, infrastructure, and lives. The Proposed Action likely would be consistent with long-term planning efforts described in community comprehensive and master plans by reducing the impacts of flooding, promoting long-term resilience to changing climatic conditions, and protecting public health and safety. In addition, implementation of the Proposed Action likely would not require changes in zoning within these communities. Thus, there could be long-term, minor benefits on land use and zoning from implementation of the Proposed Action.

4.4.3. Noise

Noise is regulated at the federal level by the Noise Control Act of 1972, 42 U.S.C. §§ 4901 *et seq.*, and is defined as undesirable sound. Noise standards developed by EPA (1974) provide a basis for state and local governments' judgments in setting local noise standards. Local governments often implement noise ordinances that limit excessive noise, such as time limits on construction work.

Sound is usually measured in decibels on the A-weighted scale (a scale based on the range of sounds that the human ear can hear); it is expressed as A-weighted decibels. The day–night averaged sound level (DNL or Ldn) is an average measure of sound for a 24-hour period expressed in A-weighted decibels. It considers the volume of each sound incident, the number of times each incident occurs, and the time of day each incident occurs (nighttime sound being weighted more heavily because it is assumed to be more disruptive to the community). Federal agencies accept the DNL descriptor as a standard for estimating sound impacts and establishing guidelines for compatible land uses.

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are considered noise. Noise events that occur during the night (e.g., 10 p.m. to 7 a.m.) are more annoying than those that occur during regular waking hours (e.g., 7 a.m. to 10 p.m.). Assessment of noise impacts includes consideration of the proximity of the noise sources to sensitive receptors. A sensitive receptor is an area of frequent human use that would benefit from a lowered noise level.

Typical sensitive receptors in developed areas include residences, schools, churches, hospitals, and libraries. In more sparsely developed areas, noise-sensitive receptors would include recreational areas (such as parks, campgrounds, water access sites, trails) and Tribal Nation properties significance. Sensitive recreational areas are areas that rely on quiet settings as an essential part of their character. Typical noise sources in residential or recreational areas are associated with climatic conditions (wind, rain), transportation (traffic on roads, airplanes), and life sounds (people talking, children playing, yard maintenance).

The study area encompasses a wide range of noise environments, and individual project areas may include noise-sensitive receptors such as libraries, schools, parks, or residential areas. Because the purpose of the projects would be to reduce hazards that threaten structures and infrastructure, there likely would be some human use near each project area.

Alternative 1 – No Action

Under the No Action alternative, communities may implement minor mitigation efforts to reduce flooding, which would have short-term, minor, adverse noise impacts from construction activities. However, flooding would not be mitigated substantially by these efforts, and continued flooding could result in damage to structures and infrastructure. Construction to repair structures and infrastructure may follow, resulting in minor, short-term increases in noise levels from equipment use and potential detours. These activities may occur near sensitive receptors resulting in adverse impacts. Any construction work would comply with local noise ordinances that regulate the hours of construction. Therefore, long-term adverse noise impacts would be minor and relatively short in duration from both the construction of minor mitigation measures and from the repair of structures and infrastructure affected by flooding.

Alternative 2 – Proposed Action

Under the Proposed Action, construction activities would temporarily increase noise levels in each project vicinity, causing minor, short-term, adverse impacts on the ambient noise levels in the project area. Equipment to construct levees and floodwalls typically includes excavators, dump trucks, dozers, and other heavy equipment as needed. Minor traffic noise would also be produced by construction vehicles and trucks arriving and departing from the project area. If detours are required, traffic noise could be rerouted to areas that may not experience that level of vehicle noise. Construction activities would be limited to allowable construction noise hours consistent with local noise ordinances, and equipment used would meet applicable local, state, and federal noise control regulations.

The Proposed Action would reduce the risk of flood damage to infrastructure and structures, thereby indirectly reducing construction activities and associated noise that would be required to repair damage. The Proposed Action may include levee seepage and drainage control systems, such as pump stations. The pumps would be a new permanent noise source and likely would be sited away from noise-sensitive receptors. Therefore, operation of the Proposed Action would have a negligible to minor, long-term, adverse noise impact, depending on the proximity to sensitive receptors.

4.4.4. Public Services and Utilities

Utility infrastructure in the study area may include natural gas lines, electricity infrastructure, telecommunications, and potable water, wastewater, and stormwater utilities. Private suppliers often provide electricity and telecommunications to communities. Water and wastewater facilities are generally managed, owned, and operated by local municipalities. Rural project areas are often serviced by private wells and septic systems instead of public utilities. The state agencies that regulate access to adequate, safe, and reliable utility services and oversee local water authorities are listed in Table 4-6. These state agencies oversee the public and private utility companies in their respective states.

Table 4-6. State Agencies that Oversee Local Water Authorities

State	State Regulatory Agency (Utilities)	State Regulatory Agency (Water Authorities)
Illinois	Illinois Commerce Commission	Illinois Environmental Protection Agency Bureau of Water
Indiana	Indiana Utility Regulatory Commission	Indiana Department of Environmental Management
Michigan	Michigan Public Service Commission	Michigan Department of Environment, Great Lakes, and Energy
Minnesota	Minnesota Public Utilities Commission	Minnesota Pollution Control Agency
Ohio	Ohio Public Utilities Commission	Ohio Environmental Protection
Wisconsin	Wisconsin Public Utilities Commission	Wisconsin Department of Natural Resources

Public safety services include local law enforcement agencies, fire departments, and emergency medical services. Emergency response time standards frequently exist in contractual obligations between communities and emergency service organizations. As a result, there may be variation in the standards between one community and another. Most emergency response teams use roads and sometimes air transportation to reach affected people and communities. Public facilities (such as schools, hospitals, and parks) exist within the study area and may be near or within some project areas; for example, levees and floodwalls could be constructed around public facilities.

Alternative 1 – No Action

Under the No Action alternative, communities may implement minor efforts to reduce flooding. Construction of these minor flood control measures may result in minor interruptions to utilities, temporary loss in access to open spaces and parks, and potential road closures that may impede emergency services. Interruption of utility service would follow all local and state requirements to ensure minimal impact on these services. Thus, there would be a negligible to minor, short-term, adverse impact.

Flooding and flood damage would not be substantially mitigated under the No Action alternative, putting utilities and public services at risk of unplanned interruptions and damage. Common issues caused by flooding include downed power and telecommunication lines, overwhelmed stormwater systems, and interrupted water and sewer treatment service. Interruptions could last hours to days while repairs are underway, depending on the severity of the damage. Flooding could also threaten public facilities, such as hospitals, schools, and parks, resulting in damage and closures that could be temporary or long-term depending on the severity and extent of the damage. Road closures from flooding or flood-related damage could result in traffic congestion on open alternate routes, which could impact emergency response times (Section 4.4.5). Therefore, under the No Action alternative, there would be long-term, minor to moderate, adverse impacts on public services and utilities from flooding.

Alternative 2 – Proposed Action

Utilities near the project area, including power lines, gas lines, telecommunication lines, and water and sewer pipelines, may be temporarily shut off during construction of the Proposed Action. Work also may require temporary road closures and detours, which could impact the response times of emergency services. Although, in most cases, at least one lane would be kept open around the construction zone. Detour signage and flaggers would be used to redirect traffic to other routes, which may result in minor increases in traffic on alternative routes. This minor increase in traffic could result in delays in emergency response times. Impacts on traffic and circulation are discussed in more detail in Section 4.4.5. Therefore, the Proposed Action would have a negligible to minor impact on emergency services. If utilities or public facilities need to be shut off temporarily or closed during construction, the subapplicant would follow local ordinances and coordinate with utilities and public services regarding shutdown procedures and notifications. Any utilities that are abandoned in place during construction would be decommissioned to state and local standards. Thus, there may be negligible to minor, short-term, adverse impacts on utilities and public services with implementation of BMPs.

In the long term, the Proposed Action would provide flood protection and reduce flooding and erosion that otherwise could damage structures and infrastructure that provide public services and utilities. The Proposed Action would reduce the potential for (or prevent in some cases) downed power and telecommunication lines, overwhelmed stormwater systems, and the interruption of water and sewer treatment. Further, the Proposed Action would reduce the potential for future road closures from flooding and flood-related damage, which would provide more reliable routes for emergency vehicle access. Therefore, the Proposed Action would have minor to moderate, long-term benefits on public services and utilities. Any project that would cause a long-term adverse effect on utilities, including a permanent loss or major rerouting of utilities, would require an SEA. Additionally, protecting infrastructure from flooding would have beneficial effects consistent with PR&G principals, including promoting sustainable economic development and public safety (**Appendix A**).

4.4.5. Traffic and Circulation

The U.S. Department of Transportation Federal Highway Administration (FHWA) has jurisdiction over the National Highway System, which includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility. Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin are all included in FHWA's North Central Region. Each state's department of transportation is responsible for constructing and maintaining interstate highways, U.S. routes, and state roads in their state. The state department of transportation also administers federal highway funds provided to cities, towns, and counties, and supports and provides financial assistance to public transit systems, freight and passenger rail, and port facilities. Local cities, counties, and towns/townships are responsible for the roadways that are not interstate highways, U.S. routes, or state roads; and Tribal roads are under the jurisdiction of the appropriate Tribal Nation (U.S. Department of Transportation 2016).

The U.S. Department of Transportation Federal Railroad Administration (FRA) regulates most railroad operational procedures, including highway-railroad crossing signals, train speeds, train horn use, and track condition. Illinois, Indiana Michigan, Minnesota, and Wisconsin are included in Region 4 of the FRA, and Ohio is in FRA Region 2 (C.F.R. 2024). Each state's department of transportation has minimal regulatory jurisdiction over rail operations or service but can provide direction to the appropriate agency or railroad representative.

Illinois: The Illinois system of highways has four distinct highway systems and associated highway authorities under the Illinois Department of Transportation (IDOT). Each authority has jurisdiction that confers the obligation and the authority to administer, control, construct, maintain, and operate the highway system subject to the provisions of the Illinois Highway Code (IDOT 2018). The Illinois Commerce Commission works with the FRA to ensure railroad safety in Illinois (IDOT 2024).

Indiana: The Indiana Department of Transportation (INDOT) has jurisdiction over U.S. routes and state roads in the state of Indiana (INDOT 2024). The Rail Programs Office of INDOT helps to fund critical projects to maintain and improve rail service in the state (INDOT 2021).

Michigan: The Michigan system of highways has four distinct highway systems and associated highway authorities under the Michigan Department of Transportation (MDOT) (Michigan Highways 2024a). The Forest Highways are forest roads designated by the U.S. Forest Service and funded by the federal government, but are often maintained by state or local agencies, such as MDOT or the County Road Commissions in Michigan (Michigan Highways 2024b). MDOT's Office of Rail works to ensure that Michigan's rail system meets the economic needs of the state and is safe for the motoring public, rail passengers, and railroad employees (MDOT 2024).

Minnesota: In Minnesota, the primary road authority of the state highway system is the Minnesota Department of Transportation (MnDOT). State highway construction and maintenance responsibilities are divided into eight MnDOT districts (MinnesotaGo 2024). MnDOT coordinates rail crossing safety, state highway projects, and rail regulatory activities for public highway-rail grade crossings throughout Minnesota (MnDOT 2024).

Ohio: The public highways of Ohio are divided into three classes: state roads, county roads, and township roads. Ohio Department of Transportation (ODOT) maintains all interstate highways, U.S. routes, and state routes (ODOT 2023). The Public Utilities Commission of Ohio regulates rail crossings throughout Ohio (Public Utilities Commission of Ohio 2024).

Wisconsin: The Wisconsin Department of Transportation (WisDOT) has jurisdiction over the state highway system (WisDOT 2021). In Wisconsin, the Office of the Commissioner of Railroads has primary responsibility for approving the installation of new railroad crossings, alteration of existing crossings, and closure or consolidation of existing crossings (Wisconsin Office of the Commissioner of Railroads 2024).

Alternative 1 – No Action

Under the No Action alternative, communities may implement minor mitigation efforts that would have negligible to minor, short-term, adverse impacts on traffic if road closures or detours occur while the repairs are being constructed. These minor efforts would not reduce flooding impacts to the extent of the Proposed Action and transportation infrastructure would continue to be at risk for flood-induced damage. Road and rail closures may include traffic diversions if transportation systems become impassable from flood waters, flood-related damage, or repair work. Depending on the extent of damage, and the importance of the infrastructure to the community, the No Action alternative could have minor to moderate, long-term, adverse impacts on traffic and transportation.

Alternative 2 – Proposed Action

4.5. Historic Properties

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C. §§ 300101 through 307108) requires that federal agencies consider the effects of their undertakings on historic properties and afford the Advisory Council of Historic Preservation a reasonable opportunity to comment on such undertakings (36 C.F.R. § 800). The NHPA (54 U.S.C. § 300308) defines a historic property (or historic resource) as any "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places, including artifacts, records, and material remains related to such a property or resource." Following National Register Bulletin No. 36, an archaeological site is "a location that contains the physical evidence of past human behavior that allows for its interpretation." The term archaeological site refers to those that are eligible for or are listed on the National Register (historic properties) as well as those that do not qualify for the National Register. Cultural properties of historic or traditional significance—referred to as Traditional Cultural Properties—may have religious or cultural significance to federally recognized Indian tribes, or any other physical evidence of human activity considered important to a community for scientific, traditional, religious, or other reasons.

Historic properties listed, eligible for listing, or potentially eligible for listing in the National Register of Historic Places (NRHP) are subject to protection from adverse impacts resulting from a federally funded undertaking (36 C.F.R. § 800.5[a][1]).

Pursuant to 36 C.F.R. § 800.16(d), the Area of Potential Effects (APE) is defined as "the geographic area(s) within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties." Within the APE, impacts on resources are evaluated for both historic structures (aboveground resources) and archaeology (belowground resources).

In addition to the NHPA, FEMA must also comply with other federal laws that relate to historic properties:

- The Archaeological and Historic Preservation Act of 1974, 54 U.S.C. ch. 3125, provides for the survey, recovery, and preservation of significant scientific, prehistoric, archaeological, or paleontological data when such data may be destroyed or irreparably lost because of a federal, federally licensed, or federally funded (in part or whole) project.

- The American Indian Religious Freedom Act of 1978, 42 U.S.C. § 1996, provides for the protection and preservation of American Indian sites, possessions, and ceremonial and traditional rites.

4.5.1. Consultation Protocols

FEMA has established NHPA Programmatic Agreements with the individual State Historic Preservation Offices (SHPO), state emergency management agencies, and interested tribes in Indiana, Illinois, Minnesota, Michigan, Ohio, and Wisconsin. The programmatic approach in each of these executed documents stipulates roles and responsibilities for all parties, exempts certain undertakings from Section 106 review, establishes protocols and the process for consultation, facilitates identification and evaluation of historic properties, and streamlines the assessment and resolution of adverse effects to historic properties.

As stated in 36 C.F.R. § 800.2.c.2.(i)(A), any "tribe that has assumed the Section 106 responsibilities of the SHPO for activities on tribal land pursuant to Section 101(d)(2) of the act, the tribal historic preservation officer (THPO) … is the official representative for the purposes of Section 106." Therefore, FEMA consults with "the THPO in lieu of the SHPO regarding undertakings occurring on or affecting historic properties on tribal lands." Non-federally recognized tribes can participate in the Section 106 process as interested parties.

To acknowledge and honor the sovereignty of Tribal Nations, FEMA regularly coordinates with Tribal governments to ensure that FEMA policies and programs address Tribal needs. As stated in the 2019 FEMA Tribal Consultation Policy (FEMA Policy #101-002-02), "FEMA tribal consultation is the process for communicating and collaborating with federally recognized Indian tribal governments and Alaska Native Corporations (… collectively referred to as "tribal governments") to exchange information, receive input, and consider their views on actions that have tribal implications."

FEMA Region 5 regularly consults with all federally recognized Native American tribes on jurisdictional lands in Region 5 as well as notifies federally recognized tribes that reside outside of Region 5 but have areas of ancestral interest within the region.

Consultation would be conducted for each project reviewed under this PEA not covered under exceptions under each state's Programmatic Agreement with FEMA. Consultations would follow the regulations and guidance that are in place at the time of review. For each project reviewed under this PEA, FEMA would develop a list of federally recognized tribes that attaches significance to historic properties within each project's APE (54 U.S.C. 302706 [b]) and identify interested parties and contacts to be consulted with to ensure notice of an undertaking and requests for comment under Section 106 are appropriately addressed. To develop a current tribal list, FEMA would consult resources such as the tribal nations' websites, NPS, the Bureau of Land Management's maintained tribal directories, and the U.S. Department of Housing and Urban Development, Tribal Directory Assessment Tool for up-to-date information. Data received from these resources would list the federally recognized tribes that should be contacted and information of any other non-federally recognized tribes that may have an interest in the undertaking. In this way, Region 5 continuously improves its outreach to federally recognized tribes with potential interests within the six-state region.

4.5.2. Affected Environment

Flood control projects would include levees and floodwalls along waterbodies and around facilities and structures. Floodwalls and levees can be part of a system that is associated with a historic property, or individually listed or listed as a contributing resource to a historic district. Existing floodwalls and levees can play an integral part in protecting historic properties from flooding and flood-related impacts.

Streams, streambanks, and adjacent upland areas in Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin hold a rich history of Native American and Euro-American prehistoric and historic activity because waterways were commonly used as transportation corridors and were the preferred areas of human settlement spanning thousands of years. These settlements, associated with historic and prehistoric eras, could have short- and long-term settlements as well as early contact-period settlements, including Native American, military, trade, and navigation activities. These locations are often rich in the remains left by these settlements and activities. Commonly found historic resources include buildings, estates, mills, mining sites, fort complexes, shipwrecks, seawalls, and docks. More recently developed infrastructure features could include canals, ornamental masonry retaining walls, bridges, and dams. Any of these resources can be individually NRHP-eligible or they could contribute to a historic district or landscape. Stream banks and those upland areas immediately adjacent to them are often archaeologically sensitive as well, with a high likelihood to contain prehistoric sites in undisturbed soil. Each SHPO has state-level programs that provide guidelines for the recordation and evaluation of local historic properties, inventory requirements for any artifacts discovered, and preservation standards required for historic properties found within each state. The implementation of these standards would be required for compliance with Section 106 of the NHPA. Five of the six FEMA Region 5 SHPOs have digital databases with historic properties information available. Researchers can apply for access to the online system or to request a records search from the SHPO staff. As of July 2024, the Michigan SHPO is updating their current system to an online database; however, at the time of this PEA, it is not readily available. The following includes a summary by state of historic properties eligible for or listed in the NRHP as of March 2024.

Illinois: As of March 2024, there are 1,965 historic properties listed in the NRHP in Illinois. Most of the historic properties are aboveground buildings (1,391), historic districts (370), or structures (81) (NPS 2024). Only 111 archaeological sites are listed in the NRHP, and there are four unknown belowground historic properties. Of the 1,965 historic properties listed in the NRHP in Illinois, 13 districts, 57 buildings, 11 structures, 1 object, and 12 archaeological sites are designated National Historic Landmarks. In addition, there are 569 levee systems recorded in Illinois (National Levee Database 2024). While it is unclear how many could be eligible for listing in the NRHP, such systems could be impacted because of the project and would need to be assessed for their potential NRHP eligibility, if no previous evaluation is available.

Indiana: As of April 2024, there are 2,097 historic properties listed in the NRHP in Indiana. Most of the historic properties are aboveground buildings (1,359), historic districts (505), or structures (137) (NPS 2024). Only 82 archaeological sites are listed in the NRHP, and there are 14 unknown belowground historic properties. Of the 2,097 historic properties listed in the NRHP in Indiana, 9 districts, 30 buildings, 5 structures, and 3 archaeological sites are designated National Historic Landmarks. Indiana hosts 114 levee systems across the state protecting thousands of residential buildings and structures (National Levee Database 2024).

Michigan: As of April 2024, there are 2,009 historic properties listed in the NRHP in Michigan. Most of the historic properties are aboveground buildings (1,313), historic districts (397), or structures (188) (NPS 2024). Only 102 archaeological sites are listed in the NRHP, and there are seven objects. Of the 2,009 historic properties listed in the NRHP in Michigan, 11 districts, 20 buildings, 7 structures, 1 object, 3 archaeological sites, and 2 unknown belowground historical sites are designated as National Historic Landmarks. Michigan has 55 levee systems protecting residential communities across the state (National Levee Database 2024).

Minnesota: As of April 2024, there are 1,782 historic properties listed in the NRHP in Minnesota. Most of the historic properties are aboveground buildings (1,307), historic districts (221), or archaeological sites (128) (NPS 2024). Of the 1,782 historic properties listed in the NRHP in Minnesota, 8 districts, 14 buildings, 2 structures, and 4 archaeological sites are designated National Historic Landmarks. Minnesota includes more 132 levee systems (National Levee Database 2024).

Ohio: As of April 2024, there are 4,205 historic properties listed in the NRHP in Ohio. Most of the historic properties are aboveground buildings (3,125), historic districts (640), or structures (238) (NPS 2024). Only 180 archaeological sites are listed in the NRHP, and there are 15 unknown belowground historic properties. Of the 4,205 historic properties listed in the NRHP in Ohio, 9 districts, 45 buildings, 10 structures, and 13 archaeological sites are designated National Historic Landmarks. Ohio includes more than 149 levee systems across the state (National Levee Database 2024).

Wisconsin: As of April 2024, there are 2,613 historic properties listed in the NRHP in Wisconsin. Most of the historic properties are aboveground buildings (1,798), historic districts (419), or archaeological sites (297) (NPS 2024). Only 90 archaeological sites are listed in the NRHP, and there are 5 unknown belowground historic properties. Of the 2,613 historic properties listed in the

NRHP in Wisconsin, 7 districts, 29 buildings, 1 structure, 9 archaeological sites, and 2 unknown belowground historical properties are designated National Historic Landmarks. Wisconsin includes 33 levee systems across the state (National Levee Database 2024).

Alternative 1 – No Action

Under the No Action alternative, there would be no FEMA action; therefore, there would be no effect on historic and cultural resources from FEMA-funded grant activities. However, under the No Action alternative, minor measures would be implemented, likely to repair or rehabilitate existing levees and floodwalls. Because these minor measures would not necessarily be constructed with federal funding, only applicable state law would be implemented for the identification and protection of cultural resources and tribal consultation would not occur. Projects that involve work below the OHWM could still require a federal authorization and would comply with the NHPA. However, character-defining features, such as stone walls of a floodwall, could be destroyed without consideration of its potential eligibility for listing in the NRHP if the Section 106 process was not implemented. Therefore, there would be negligible to moderate, short-term, adverse impacts on cultural resources from the implementation of minor measures under the No Action alternative.

Although minor measures implemented under the No Action alternative would involve flood control work to address issues related to flooding, these effects would be limited because the measures would likely be smaller in scale and less comprehensive than the Proposed Action. Thus, in the long term, cultural resources, such as historic buildings and structures, would continue to be vulnerable to flood risks. Failed levees and floodwalls are likely to have substantial impacts on aboveground historic buildings and structures and buried archaeological sites along the waterways or within the upland locations. This could directly affect potentially historic levees or floodwalls and associated historic districts or landscapes. Indirect effects to historic buildings, structures, and districts are also likely because of failed or inadequate levees and floodwalls and increased precipitation events and rising floodwaters. Buried archaeological sites may erode out of stream banks into stream channels and can deteriorate as their individual elements disperse. Therefore, there would be a minor to major, long-term, adverse impact from flood control projects on historic and cultural resources.

Alternative 2 – Proposed Action

All action alternatives have the potential to impact aboveground historic architectural resources, both physically and visually, as well as belowground archaeological sites. Modification, reconstruction, and replacement of floodwalls and levees may directly affect aboveground historic architectural resources. Structures associated with floodwalls, such as floodgates can also be eligible for listing in the NRHP. Demolition or modification of existing facility or structure, installation of erosion and sediment control measures, and site restoration and stabilization are common scopes of work that can have a direct or indirect effect on both aboveground historic architectural resources, such as levees and floodwalls themselves or associated buildings or structures, if such work is conducted to NRHP-eligible or listed historic properties. Additionally, projects that include demolition, repair, or construction of floodwalls, levees, and/or other structures may affect character-defining elements of a historic property. To minimize such impacts, each project should follow the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (36 C.F.R. Part 68, 1995), which

consists of four treatment standards—Preservation, Rehabilitation, Restoration, and Reconstruction (NPS 2023b). Common themes of each of the standards include, but are not limited to, that a property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials features, spaces, and spatial relationships; that the historic character of a property will be retained and preserved; that distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved; and that deteriorated features from the period of significance will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials; and replacement of missing features from the period of significance will be substantiated by documentary and physical evidence. A false sense of history will not be created by adding conjectural features, features from other properties, or by combining features that never existed together historically.

Archaeological resources have a high potential of being impacted by construction excavation and staging, excavation in embankment and upland areas, site restoration and stabilization, and site access activities that disturb previously undisturbed soils. Before the start of a project, FEMA and the subapplicant would comply with the NHPA by identifying the potential for resources to occur in the project area and conducting appropriate consultations. To comply with the NHPA, project-specific consultation with the SHPO or THPO would be necessary for all flood control projects along streambanks and any identified connected actions that are covered by the Proposed Action. FEMA would conduct a Section 106 consultation for each project application in accordance with the NHPA and any applicable Historic Preservation Programmatic Agreement before the grant is awarded. The Section 106 process requires consideration of the potential for known and unknown resources to be affected, including a good faith effort to identify all resources within a project area. FEMA would identify the APE for each project and determine whether there were any historic or cultural resources potentially present within the project area. This identification would be conducted in consultation with the SHPO and the THPO, and any interested parties, including tribes, as appropriate. The APE would consider the horizontal and vertical areas of disturbance, including auditory or visual impacts to sites of cultural or religious significance to Tribal Nations. This would account for any demolition or modification of existing facility or structure, installation of erosion and sediment control measures, excavation, and site restoration and stabilization to encompass any access and staging areas required to implement the project. Field surveys for architectural or archaeological assessments may be needed to determine whether resources are present, particularly if there are compromised structures.

To minimize potential impacts on historic properties, low-impact equipment should be used to cross intact landscapes to access project areas to the extent practicable (e.g., rubber-tired vehicles and equipment). Grading and dredging should be limited to the minimum required depth and avoid natural cultural-bearing strata, if possible. Existing roads and access points should be used to the maximum extent possible to limit construction-related land clearing and impacts from heavy machinery. If new access roads or staging areas are required, those areas would be surveyed for the presence of cultural resources before construction begins. If appropriate, shoreline stabilization structures would be constructed with materials that are context sensitive.

If resources are identified as potentially present, including a levee or floodwall, then FEMA would determine whether the resource could be affected by the proposed undertaking and would consult with the SHPO or THPO and other potentially interested parties, as appropriate on potential effects, and any avoidance or mitigation measures proposed. If any adverse effects are identified, FEMA would consult on any identified mitigation measures as appropriate.

Inadvertent discovery protocols would be applied as a mitigation measure to any project that proposes ground-disturbing activities, regardless of how minor the disturbance may appear. Inadvertent discovery protocols specify that if archaeological deposits, including any Native American properties, stone tools, bones, or human remains, are uncovered, all work near the discovery must be halted immediately, and all reasonable measures must be taken to avoid or minimize harm to the finds. All archaeological resources would be secured, and the subapplicant would restrict access to the sensitive area. The subapplicant would inform FEMA immediately of such finds, and FEMA would consult with the SHPO or THPO, as appropriate. Work in sensitive areas would not resume until consultation is complete and after FEMA determines that the appropriate measures have been taken to ensure project compliance with the NHPA.

A tiered SEA would be required for any project for which FEMA makes an adverse effect determination that must be resolved through a state's specific Programmatic Agreement Treatment Measure protocols or a memorandum of understanding with the SHPO, THPO, and any additional consulting parties.

Through Section 106 consultation with the SHPO and THPO and the application of project-specific mitigation measures developed through the consultation process, potential effects to aboveground and belowground historic properties and submerged cultural resources would be assessed as negligible to moderate in both the short and long term.

4.6. Comparison of Alternatives

Table 4-7 provides a summary of the potential environmental effects from implementing the Proposed Action, any required agency coordination efforts or permits, and any applicable proposed mitigation or BMPs.

Table 4-7. Summary of Impacts and Mitigation

Resource	No Action Impacts	Proposed Action Impacts	Mitigation
Soils and Topography	• Minor, short-term, adverse impacts. • Minor to moderate, long-term, adverse impacts.	• Minor, short-term, adverse impacts on soil and topography. • Minor to moderate, long-term benefit.	• Adhere to BMPs from permits and SWPPP.

Resource	No Action Impacts	Proposed Action Impacts	Mitigation
Water Resources and Water Quality	• Minor, short-term, adverse impacts. • Minor to moderate, long-term, adverse impacts on surface waters. Minor, long-term impacts on aquifers.	• Minor, short-term, adverse impacts. • Long-term, minor to moderate, beneficial impact on surface water and groundwater quality.	• Adhere to BMPs from permits, regulations, and SWPPP. • Ensure construction equipment is maintained to mitigate spills and leaks.
Floodplains	• Negligible to minor, short-term, adverse impact • Minor to moderate, long-term, adverse impact on floodplains.	• Minor, short-term, adverse impacts • Minor to moderate, long-term benefit on floodplains.	• Adhere to all conditions issued by local floodplain manager.
Wetlands	• Minor to moderate, short- and long-term adverse impacts on wetlands.	• Minor, short-term, adverse impacts. • There would be none to minor adverse impacts on wetlands, in the short and long term, if CWA Permits would be followed. • Minor to moderate, long-term benefit from reduced risk of flooding.	• Avoid permanent impacts on wetlands and follow BMPs from permits.
Air Quality	• Minor, short-term, adverse impacts • Minor, periodic, long-term adverse impacts.	• Negligible to minor, short-term, adverse impacts. • No long-term impacts. • Minor long-term benefits from reduced need for flood-related repairs.	• Adhere to BMPs provided in EPA's Construction Emission Control Checklist (**Appendix B**).
Coastal Resources	• Negligible to minor, short-term adverse effects from non-FEMA-related flood mitigation projects. • Negligible to minor, short-term, adverse effects from continued risk of flooding.	• Negligible to minor, short-erm, adverse impacts from construction activities. • Negligible to minor, long-term benefits from improved water quality, benefits to wildlife habitats and fisheries, and improved accessibility of recreational areas within coastal zones.	• Adhere to state coastal management plan requirements.
Vegetation and Invasive Species	• Minor to moderate, short-erm adverse effects from non-FEMA-related flood mitigation projects. • Negligible to minor, long-term, adverse effects from continued risk of flooding.	• Minor to moderate, short-term, adverse effects from construction-related vegetation removal and soil compaction. • Long-term, negligible to minor, beneficial effects from reduced flooding and erosion and improved water quality.	• Adhere to the respective project's state-invasive species management plan or regulations when applicable.
Fish and Wildlife	• Negligible to minor, short-term, adverse impacts from	• Short-term, adverse effects from construction-related impacts that could	• Work to construct or repair flood control projects would adhere to

Resource	No Action Impacts	Proposed Action Impacts	Mitigation
	construction of non-FEMA-funded flood mitigation projects. • Minor to moderate, long-term, adverse impacts from continued flooding, which could result in erosion, sediment transport, and reduced water quality.	displace, injure, or kill individuals present during construction. • Minor to moderate, short-term, adverse impacts from construction. • Minor to moderate, long-term benefits from reduced flooding, which would improve aquatic and terrestrial habitats.	the respective project's state-invasive species management plan or regulations when applicable. • Adherence to any relevant conditions prescribed in project-specific permits or agency consultations.
Threatened and Endangered Species and Critical Habitat	• Negligible to moderate, short-term, adverse impact from non-FEMA-funded flood mitigation project-related construction disturbance or habitat modification. • Minor to moderate, long-term, adverse impacts from non-mitigated flooding, including direct impacts on species (fatalities, displacement), and indirect impacts from decreased suitable habitat from flood-related erosion, sediment transport, and pollutant transport.	• Up to moderate, short-term, adverse effects from construction-related impacts that could displace, injure, or kill individuals present during construction. • Minor to moderate, long-term, benefits from reduced flooding, which would improve aquatic and terrestrial habitats.	• FEMA would review and make the appropriate consultations before implementing any projects under the Proposed Action. • Adhere to conditions in project-specific permits and/or agency consultations.

Resource	No Action Impacts	Proposed Action Impacts	Mitigation
Hazardous Materials	• Negligible to minor, short-term, adverse impacts. • Negligible to moderate, long-term, adverse impacts on hazardous materials from flooding.	• Negligible to minor, short-term, adverse impacts from construction activities. • Minor to moderate, beneficial, long-term benefit from protecting hazardous sites from flooding.	• Any hazardous and contaminated materials discovered, generated, or used during construction of the Proposed Action would be disposed of and handled by the subapplicant in accordance with applicable federal, state, and local regulations. • Construction equipment would be kept in proper working order. Any equipment to be used above, in, or within 100 feet of water would be inspected daily for fuel and fluid leaks. Any leaks would be promptly contained and cleaned up, and the equipment would be repaired. • Any fill used at the project site would be obtained from a state-licensed source. • In the event of an inadvertent spill, the subapplicant must immediately contact the appropriate regulatory agency, or other contact listed on the subapplicant's permits, if applicable.
Land Use and Planning	• Negligible, short- and long-term, adverse impact.	• Minor, long-term, benefits on land use and zoning from reduced flooding and erosion.	
Noise	• Minor, short-term, adverse impacts. • Intermittently minor, long-term, adverse impacts.	• Minor, short-term, adverse impacts. • Negligible to minor, long-term, adverse impacts.	

Resource	No Action Impacts	Proposed Action Impacts	Mitigation
Public Services and Utilities	• Negligible to minor, short-term, adverse impacts. • Minor to moderate, long-term, adverse impacts on public services and utilities from continued flooding and erosion.	• Negligible to minor, short-term, adverse impacts on public services and utilities from construction activities. • Minor to moderate, long-term benefits on public services and utilities from reduced flooding and erosion.	• If utilities need to be shut off temporarily during construction, the subapplicant would follow local ordinances regarding shutdown procedures and notification. • Utilities that are abandoned in place would be decommissioned to state and local standards. • Subapplicant would develop a maintenance of traffic plan to determine detours and methods to accommodate emergency response vehicles during construction.
Traffic and Circulation	• Negligible to minor, short-term, adverse impacts. • Minor to moderate, long-term, adverse impacts.	• Minor to moderate, short-term, adverse impact from road closures and detours. • Minor to moderate, long-term benefit.	• Traffic mitigation measures, such as the installation of clear detour signage or flaggers, would be required.
Cultural Resources	• Negligible to minor, short-term, adverse impacts on historic and cultural resources from minor mitigation construction activity. • Minor to major, long-term, adverse impact on historic and cultural resources from continued flood risks, further erosion, and scouring impacts.	• Negligible to moderate effects on historic and cultural resources depending on the scope and location of specific projects. FEMA would initiate consultation with the SHPO and/or THPOs, as appropriate, for each project in accordance with Section 106 of the NHPA.	• Projects that include demolition, repair, or construction of floodwalls, levees, and/or other structures may affect character-defining elements of a historic property. To minimize such impacts, each project should follow the Secretary of the Interior's Standards for the Treatment of Historic Properties (36 C.F.R. Part 68, 1995). • Low-impact equipment should be used to cross intact landscapes to access the shoreline to the extent practicable (e.g., rubber-tired vehicles and equipment). • If appropriate, planting plans should be designed in keeping with the historic context.

SECTION 5. Cumulative Effects

This section addresses the potential cumulative effects associated with the implementation of the Proposed Action. Cumulative effects represent the "impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. 'Reasonably foreseeable' means sufficiently likely to occur such that a person of ordinary prudence would take it into account in reaching a decision. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 C.F.R. 1508.1). CEQ's regulations for implementing NEPA require an assessment of cumulative effects during the decision-making process for federal projects. This PEA reviews the potential for other construction projects to create cumulative effects in and near the project area. Other statutes also require federal agencies to consider cumulative effects. These include the CWA Section 404(b)(1) guidelines, the regulations implementing the conformity provisions of the CAA, the regulations implementing Section 106 of the NHPA, and the regulations implementing Section 7 of the ESA.

Projects covered under the Proposed Action of this PEA may have additional activities included within their respective scopes that normally would be covered under FEMA Categorically Excluded (CATEX) projects (FEMA Instruction 108-1-1) individually. However, there may be cases where these separate actions would not function without the Proposed Action and, therefore, must be evaluated as a complete project. CATEX N9 is expected to be used in conjunction with many projects covered under the Proposed Action; however, it would not cover levees or floodwalls.

CATEX N9, *Federal Assistance for Flood Hazard Reduction Actions*, provides assistance for drainage, berm, water crossing, and detention, retention, or sediment pond projects that have the primary purpose of addressing flood hazards as well as meeting the following criteria:

- Do not affect more than 25 acres.
- Do not result in adverse flood risk effects to downstream communities.
- Do not result in any increase of flood levels within the community during the occurrence of the base flood discharge if the action takes place within the regulatory floodway.
- Where the effect of the proposed project when combined with other existing or reasonably foreseeable development will not increase water surface elevation of the base flood more than 1 foot at any point within the community if the action takes place in a floodplain with no regulatory floodway.

This CATEX covers minor flood control actions as identified in Sections 1366 and 1361 of the National Flood Insurance Act (NFIA). Actions not covered in Sections 1366 and 1361 of the NFIA, such as dikes and levees, are excluded from this CATEX.

FEMA anticipates any N9 CATEX action connected to Proposed Actions would not have cumulatively significant adverse impacts on environmental or historic resources. If any projects covered under the PEA, in conjunction with the other cumulative projects, would have major impacts or impacts that cannot be mitigated, a separate SEA would be required.

SECTION 6. Agency Coordination and Public Involvement

6.1. Notice of Intent

FEMA published a notice of intent (NOI) to solicit input on the proposed PEA from other federal and state agencies, tribes, and the public. Because of the large geographic area covered, the NOI was published in multiple locations on multiple dates (**Table 6.1**). The comment period to solicit input on the scope of the analysis was held open for 30 days following the latest publication date. Scoping closed on August 13, 2024. Agencies, tribes, and interested persons were requested to comment on the purpose and need of the Proposed Action, alternatives, potential environmental impacts, and measures to reduce those impacts.

6.1.1. Notice of Intent Distribution

FEMA published the NOI in a major newspaper of each state within the study area (as outlined in (**Table 6-1**). The NOI was sent directly to federal and state agencies and tribes for comment, as shown in **Table 6-2**.

Table 6-1. Notice of Intent Newspaper Publication

State	Newspaper	Date Published
Illinois	*Chicago Tribune*	July 12, 2024
Indiana	*Indianapolis Star*	July 14, 2024
Michigan	*Detroit Free Press*	July 12, 2024
Minnesota	*Star Tribune*	July 14, 2024
Ohio	*The Plain Dealer*	July 14, 2024
Wisconsin	*Milwaukee Journal Sentinel*	July 14, 2024

Table 6-2. Notice of Intent Agency and Tribal Distribution

Federal	State	Tribal
Bureau of Indian Affairs	Illinois Coastal Management Program	Absentee Shawnee Tribe of Oklahoma
National Oceanic and Atmospheric Administration (NOAA)	Illinois Department of Natural Resources–Office of Water Resources	Bad River Band of Lake Superior Tribe of Chippewa Indians
U.S. Army Corps of Engineers:	Illinois National Flood Insurance Program State Coordinator	Bay Mills Indian Community, Michigan
Chicago Regulatory Branch	Illinois State Hazard Mitigation Officer	Bois Forte Band of Chippewa Indians
Buffalo Regulatory Branch	Illinois State Historic Preservation Office	Cherokee Nation
Detroit Regulatory Branch	Indiana Coastal Management Program	Chippewa Cree Tribe of the Rocky Boy's Reservation of Montana
Huntington Regulatory Branch	Indiana Department of Natural Resources–Water	Citizen Potawatomi Nation
Louisville Regulatory Branch	Indiana Department of Environmental Management	Delaware Nation
Memphis Regulatory Branch	Indiana National Flood Insurance Program	Delaware Tribe of Indians
Pittsburgh Regulatory Branch	Indiana State Hazard Mitigation Officer	Eastern Shawnee Tribe of Oklahoma
Rock Island Regulatory Branch	Indiana State Historic Preservation Office State Coordinator	Flandreau Santee Sioux Tribe of South Dakota
St. Louis Regulatory Branch	Michigan Coastal Management Program	Fond du Lac Band of Lake Superior Chippewa
St. Paul Regulatory Branch	Michigan Environment, Great Lakes, and Energy–Water Resources	Forest County Potawatomi Community of Wisconsin
U.S. Department of Agriculture: Rural Development	Michigan Environment, Great Lakes, and Energy–Office of the Great Lakes	Fort Peck Assiniboine and Sioux Tribes
Natural Resource Conservation Service	Michigan National Flood Insurance Program	Grand Portage Band of Lake Superior Chippewa
U.S. Department of Interior	Michigan State Hazard Mitigation Officer	Grand Traverse Band of Ottawa and Chippewa Indians
U.S Environmental Protection Agency, Region 5	Michigan State Historic Preservation Office	Hannahville Indian Community
U.S. Fish and Wildlife Service:	Minnesota DNR, Division of Water	Ho–Chunk Nation
Illinois Field Office	Minnesota Coastal Management Program	Iowa Tribe of Kansas and Nebraska
Indiana Field Office	Minnesota State Historic Preservation Office	Keweenaw Bay Indian Community
Michigan Field Office	Minnesota National Flood Insurance Program	Kickapoo Traditional Tribe of Texas
Minnesota Field Office	Minnesota State Hazard Mitigation Officer	Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas
Ohio Field Office	Ohio Coastal Zone Management Program	Kickapoo Tribe of Oklahoma
Wisconsin Field Office		
U.S. Forest Service		
U.S. Geological Survey		

Federal	State	Tribal
U.S. Housing and Urban Development, Region 5	Ohio Environmental Protection Agency Ohio National Flood Insurance Program State Coordinator Ohio State Hazard Mitigation Officer Ohio State Historic Preservation Office Wisconsin Coastal Management Program Wisconsin Department of Natural Resources – Secretary and Directors Wisconsin National Flood Insurance Program State Coordinator Wisconsin State Historic Preservation Office State Coordinator Wisconsin State Hazard Mitigation Officer	Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin Lac du Flambeau Band of Lake Superior Chippewa Indians of Wisconsin Lac Vieux Desert Band of Lake Superior Chippewa Indians Leech Lake Band of Ojibwe Little River Band of Ottawa Indians Little Traverse Bay Bands of Odawa Indians Lower Sioux Indian Community of Minnesota Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians of Michigan Menominee Indian Tribe of Wisconsin Miami Tribe of Oklahoma Mille Lacs Band of Ojibwe Indians Nottawaseppi Huron Band of the Potawatomi Oneida Nation of Wisconsin Osage Nation Ottawa Tribe of Oklahoma Peoria Tribe of Indians of Oklahoma Pokagon Band of Potawatomi Indians Ponca Tribe of Nebraska Prairie Band Potawatomi Nation Prairie Island Indian Community Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin Red Lake Band of Chippewa Indians of Minnesota Sac and Fox Nation

Federal	State	Tribal
		Sac and Fox Nation of Missouri in Kansas and Nebraska Sac and Fox Tribe of the Mississippi in Iowa Saginaw Chippewa Indian Tribe of Michigan Santee Sioux Tribe Sault Ste. Marie Tribe of Chippewa Indians of Michigan Seneca Nation of Indians Seneca-Cayuga Nation Shakopee Mdewakanton Sioux Community of Minnesota Shawnee Tribe Sisseton Wahpeton Oyate of the Lake Traverse Reservation, South Dakota Sokaogon Chippewa Community Spirit Lake Tribe of Fort Totten St. Croix Chippewa Indians of Wisconsin Stockbridge-Munsee Community Band of Mohican Indians Tonawanda Band of Senecas Turtle Mountain Band of Chippewa Upper Sioux Community of Minnesota White Earth Band of Ojibwe Winnebago Tribe of Nebraska Wyandotte Nation

Following is a summary of the responses received during the NOI comment period:

- The USACE Memphis District provided a response accepting the responsibility of a cooperating agency on June 28, 2024.
- The Wisconsin SHPO confirmed on July 2, 2024, that they received the NOI and look forward to reviewing the PEA.
- The USACE Huntington District provided a response accepting the responsibility of a cooperating agency on July 3, 2024.
- Ohio SHPO responded on July 26, 2024, stating certain activities could not be streamlined. FEMA responded the same day clarifying that the PEA covers general impacts and procedures and that they will still consult on individual projects that require it.
- EPA Region 5 provided comments and recommendations for the PEA on July 29, 2024. Their letter included recommendations on how FEMA should conduct the NEPA process for the PEA including public outreach and what should be included in their coastal resources, water quality, wetland, contaminated waters and soils, NHPA, and ESA impact review (Appendix D). FEMA addressed their recommendations, limiting use of their input to comply with recent EO recissions (see Section 6.2) and included them throughout the PEA.

6.2. Notice of Availability and Public Comment

The Draft PEA was made available for agency and public review and comment for a period of 30 days, from January 4, 2025, to February 3, 2025. An electronic copy was made available for review on FEMA's NEPA repository at https://www.fema.gov/emergency-managers/practitioners/environmental-historic/nepa-repository. FEMA also sent a notification regarding the availability of the Draft PEA for review and comment to agencies who received the NOI and published a Notice of Availability to the papers listed in **Table 6-1**.

During the 30-day public comment period, FEMA received comments on the PEA. Comments received on the PEA are listed below:

- Minnesota Department of Natural Resources confirmed receipt of the NOA on January 7, 2025.
- Wisconsin Department of Natural Resources confirmed receipt of the NOA on January 7, 2025.
- EPA confirmed they have no substantive comments on February 3, 2025.
- Wisconsin SHPO confirmed no comments on January 19, 2025
- USACE Huntington District office confirmed receipt of the NOI on February 13, 2025, and accepted the invitation to serve as a cooperating agency. They provided a list of information that should be provided during pre-application consultation for any project covered under the PEA.

- USACE North Branch office confirmed receipt of the NOA on January 7, 2025.
- USACE St. Louis office confirmed receipt of the NOA on January 14, 2025.
- USFWS Indiana Ecological Field Office confirmed receipt of the NOA on January 7, 2025.
- USFWS Michigan Ecological Field Office confirmed receipt of the NOA on January 7, 2025.
- USFWS Minnesota-Wisconsin Ecological Field Office confirmed receipt of the NOA on January 7, 2025.

EO 12898 ("Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations") and 14096 ("Revitalizing Our Nation's Commitment to Environmental Justice for All") were rescinded on January 20 and 21, 2025 by EO 14154 ("Unleashing American Energy") and 14173 ("Ending Illegal Discrimination and Restoring Merit-Based Opportunity"). On January 20, 2025, Executive Order 14148-Initial Rescissions of Harmful Executive Orders and Action rescinded five EOs related to climate change activities and terminology, to include EO 13990-Protecting Health and the Environment and Restoring Science to Tackle the Climate Crisis. FEMA prepared the analyses in this Environmental Assessment and provided an opportunity for public participation prior to the recission of these climate related EOs. As a result, this PEA has been updated to reflect these changes and, in accordance with NEPA, FEMA is releasing this Revised Draft PEA to the public, federal and state agencies, and tribes listed in **Table 6-2** for a 15-day public review and comment period. The Notice of Availability was posted to the state newspapers of record (**Table 6-1**) and the Revised Draft PEA will be made available on FEMA's NEPA repository (https://www.fema.gov/emergency-managers/practitioners/environmental-historic/nepa-repository).

Comments on the draft PEA may be submitted to fema-r5-environmental@fema.dhs.gov with the subject line "Flood Control PEA." Comments may also be submitted via mail to:

Duane Castaldi
Regional Environmental Officer
FEMA Region 5
536 South Clark Street, 6th Floor
Chicago, IL 60605-1521

6.3. Preparation of Supplemental Environmental Assessments

Any SEAs that are tiered off the PEA would go through an appropriate level of public review before FEMA makes a NEPA compliance determination for those specific projects. When a Proposed Action could result in impacts on the environment beyond those described in this PEA and require mitigation in addition to that included in this document, or has the potential for public controversy, FEMA would prepare and circulate a draft SEA for public and agency review and comment. For these types of activities, FEMA would prepare a separate decision document (i.e., a Finding of No Significant Impact or NOI to prepare an Environmental Impact Statement). A summary of thresholds are listed below in **Table 6-3**.

FEMA would comply with the public notification process required for compliance with EO 11988, EO 11990, and 40 C.F.R. § 9, when applicable for an action. Additionally, a cumulative public notice will be published at the time of the Presidential Declaration of each future disaster under which FEMA-funded projects may be proposed that could be covered by this PEA for NEPA compliance.

Table 6-3 SEA Threshold Summary

Area of Evaluation	Project Covered by This PEA	Tiered SEA Required
NEPA	Projects that are under 1 mile in length, including length of levees around infrastructure. And No more than 10 acres of ground disturbance.	Projects that are greater than 1 mile in length. Or Projects that disturb more than 10 acres of ground disturbance.
Soils and Topography	Negligible to moderate impacts on soils or topography. Or Mitigation measures are used to reduce potential impacts to a minor level.	Major impacts on soils or topography.
Water Resources and Water Quality	Negligible or minor impacts on water quality and would not exceed water quality standards or criteria. Or Mitigation measures are used to reduce potential impacts to a moderate level.	Projects resulting in permanent long-term impacts, such as permanent adverse impacts from fill and loss of Waters of the United States that may require compensatory mitigation.
Floodplain Management	The proposed project is not located in or does not adversely affect floodplains. Or Project is for floodplain restoration that has a beneficial impact on the floodplain. Or Mitigation measures are used to reduce potential temporary impacts to a minor or moderate level.	Projects that do not comply with the National Flood Insurance Program regulations would not be funded by FEMA. Projects that have adverse effects to floodplains or increase flood heights would be reviewed pursuant to C.F.R. 44 Part 9 and additional requirements and mitigation may be discussed in an SEA.
Wetlands	The proposed project is not located in or does not adversely affect wetlands. Or Mitigation measures are used to reduce potential temporary impacts to a minor or moderate level.	Project or a measure that would adversely affect wetlands in such a way that a regulatory agency would require compensatory mitigation.
Air Quality	Emissions in nonattainment and maintenance areas would be temporary and less than exceedance levels. Or Emissions in attainment areas would be temporary and not cause air quality to go out of attainment for any NAAQS. Or Mitigation measures are used to reduce potential impacts below the level described above.	The proposed project would result in new, long-term source(s) of air emissions. Or Temporary emissions would exceed de minimus thresholds causing a moderate or greater adverse effect on air quality.

Area of Evaluation	Project Covered by This PEA	Tiered SEA Required
Coastal Resources	The proposed project is located or partially located in the coastal zone and minimizes adverse effects because mitigation measures are used to reduce impacts to a minor or moderate level. Concurrence that project is consistent with state coastal zone management plan is required.	The proposed project would be found to be inconsistent with state CZM policies.
Vegetation and Invasive Species	Negligible to moderate short-term impacts on native species, their habitats, or the natural processes sustaining them. Population levels of native species would not be affected. Sufficient habitat would remain functional to maintain the viability of all species. And Any vegetation planting would be done using native vegetation.	None. Any proposed project would be required to follow all conditions with this PEA.
Fish and Wildlife	Negligible to moderate short-term impacts on native species, their habitats, or the natural processes sustaining them. Population levels of native species would not be affected. Sufficient habitat would remain functional to maintain the viability of all species. Or Project work occurs outside the buffer for Eagle and migratory bird nesting grounds or the implementation of adequate recommendations from coordination with USFWS and the National Bald Eagle Management Guidelines.	None. Any proposed project would be required to follow all conditions with this PEA.
Threatened and Endangered Species	FEMA can make a “No Effect” determination. Or FEMA can make a “Not Likely to Adversely Affect” determination along with concurrence from USFWS and/or NMFS. Or Mitigation measures, including conservation measures provided by USFWS or NMFS, are used to reduce potential impacts to a minor level or to a level where the project is not likely to adversely affect listed species.	The proposed project falls under a “likely to adversely affect” determination
Hazardous Materials	Hazardous or toxic materials or wastes would be safely and adequately managed in accordance with all applicable regulations and policies, with limited exposures or risks. And Projects would not involve the addition of hazardous facilities, operations, or chemicals to the project area.	A Phase I or II environmental site assessment indicates that contamination exceeding reporting levels is present and further action is warranted. Or Project involves the addition of hazardous facilities, operations, or chemicals to the project area.
Land Use and Planning	Proposed project causes no adverse impact on existing land uses or zoning.	None

Area of Evaluation	Project Covered by This PEA	Tiered SEA Required
Noise	Construction activities would be limited to allowable construction noise hours consistent with local noise ordinances. And Equipment used would meet applicable local, state, and federal noise control regulations	None
Public Services and Utilities	The proposed project would have only negligible or minor impacts on public services and utilities. Or Mitigation measures are used to reduce potential impacts to a minor level.	Projects that would cause a long-term adverse effect on utilities, including a permanent loss or major rerouting of utilities.
Traffic and Circulation	Proposed project would have only negligible to moderate impacts on traffic and transportation. Or Mitigation measures are used to reduce potential impacts to a moderate level.	None
Historic and Cultural Resources	No historic properties are affected. Or FEMA can make a determination of "No Adverse Effect" with concurrence from the SHPO and/or THPO as appropriate.	Projects for which an Adverse Effect determination was made that must be resolved through a state's specific Programmatic Agreement Treatment Measures or a memorandum of understanding with the SHPO, THPO, and any additional consulting parties.
Cumulative Impacts	No past, present, or future actions are near the project area. Or Proposed project in connection with CATEXed actions would have no significant adverse impact on environmental or historic resources.	Projects covered under the PEA, in conjunction with CATEXs, that would have major impacts or impacts that cannot be mitigated.

SECTION 7. Project Conditions and Permits

The Subapplicant is responsible for compliance with all federal, state, and local laws and regulations, including obtaining any necessary permits before beginning the flood control projects activities and adhering to any conditions laid out in those permits. Any substantive changes, additions, and/or supplements to the approved scope of work that alter the scope of work, including additional work not funded by FEMA but performed substantially at the same time, will require re-submission of the application prior to construction to FEMA for re-evaluation under NEPA. Failure to comply with FEMA grant conditions may jeopardize federal funding.

SOILS, WATER RESOURCES AND WATER QUALITY, FLOODPLAINS, WETLANDS, AND COASTAL RESOURCES

- Projects that would result in the conversion of important farmland soils to non-farm uses would need to consult with NRCS and complete a land evaluation and site assessment (U.S. Department of Agriculture's Form AD-1006).

- Subapplicants must coordinate with USACE and their respective state agency listed in Table 4-2 to obtain any required CWA permits or nationwide permit authorizations.

- Subapplicant must develop a SWPPP in accordance with the required NPDES permit.

- Subapplicants must comply with state and local floodplain and floodway regulations, including coordination with their local floodplain manager.

- If a modification to the existing regulatory floodway, BFEs, or SFHA is anticipated, the Subapplicant would request to obtain a CLOMR through procedures set forth in 44 C.F.R. 72.

- Subapplicants must comply with state coastal management plan requirements for all projects within the coastal zone.

AIR QUALITY

- Subapplicants must adhere to all EPA, state, and local emissions standards.

VEGETATION AND INVASIVE SPECIES

- Vehicles and equipment must be confined to existing roadways to the maximum extent practicable.

- Vehicles used off-road will be rubber-tired to the maximum extent practicable to reduce the potential for soil disturbance.

- For projects involving planting vegetation, native plants appropriate for site conditions must be used.

FISH AND WILDLIFE

- All equipment used in the water must be sprayed/rinsed with high-pressure hot water to clean off mud and kill aquatic invasive species after use in project areas. Motor, bilge, live well, and other water-containing devices from all equipment must be drained before leaving aquatic project areas.

- All equipment used in the water for five days or more must be dried or wiped dry with a towel before use in another waterbody.

- To the maximum extent practicable, vegetation removal must be avoided from March through August to avoid impacts on nesting migratory birds.

- If bald or golden eagles are present in the project area, subapplicants must consult with USFWS to develop mitigation measures (pursuant to 16 U.S.C. § 668).

- Conduct in-water work during times of the year that minimize adverse effects on fish spawning areas during spawning seasons.

THREATENED AND ENDANGERED SPECIES

- BMPs related to the protection of water quality, wetlands, vegetation, and fish and wildlife habitat must be implemented.

- As needed, avoidance and minimization measures must be developed in consultation with USFWS, in accordance with Section 7 of the ESA (50 C.F.R. Part 402).

HAZARDOUS MATERIALS

- Excavated soil and waste materials must be managed and disposed of in accordance with applicable federal, state, and local regulations. In the event of discovery of soil or water contaminants exceeding reportable levels, the subapplicant and its construction contractor(s) will follow applicable federal, state, and local protocol to report and handle the contaminants appropriately.

- All fill material must come from preexisting stockpiles or commercially procured material from a permitted and licensed source. Documentation of borrow sources used is required at closeout.

- If hazardous materials (or evidence thereof) are discovered during the implementation of the project, the subapplicant must handle, manage, and dispose of petroleum products, hazardous materials, and/or toxic waste in accordance with the requirements and to the satisfaction of the governing local, state, and federal regulations.

- During construction, the subapplicant and/or their contractor must notify the local regulatory agency (**Table 4-5**) about any sudden release or spill of any chemical (either oil or a hazardous material) that exceeds the threshold for a reportable quantity. Local agencies have

cleanup regulations that require reportable quantities of spills and other sudden releases be reported so that assessment and cleanup can begin. Copies of documentation to and from the local regulatory agency must be forwarded to the State and FEMA for inclusion in the administrative record.

LAND USE AND PLANNING

- Projects must be consistent with local land-use plans as described in community comprehensive and master plans.

NOISE

- Construction activities must comply with allowable construction noise hours and be consistent with local noise ordinances.

- Equipment used would meet applicable local, state, and federal noise control regulations.

PUBLIC SERVICES AND UTILITIES

- If utilities need to be shut off temporarily during construction, the subapplicant must follow local ordinances regarding shutdown procedures and notification.

- Utilities that are abandoned in place must be decommissioned in accordance with state and local standards.

- strategies to effectively engage these populations about the proposed project.

ARCHAEOLOGICAL RESOURCES AND TRIBAL AND RELIGIOUS SITES

- Project designs should minimize deep cuts into natural cultural resource–bearing strata during grading and excavation to the maximum extent possible.

- Existing roads and access points should be used to the maximum extent possible, and the creation of new access roads minimized. If new access roads or staging areas are required, those areas would be surveyed for the presence of cultural resources before construction begins.

- Low-impact equipment should be used to cross intact landscapes to access flood control projects to the extent practicable (e.g., rubber-tired vehicles and equipment).

- If appropriate, planting plans should be designed in keeping with the historic context.

SECTION 8. List of Preparers

The following is a list of preparers who contributed to the development of the Levee Flood Mitigation Projects Programmatic Environmental Assessment for FEMA. The individuals listed below had principal roles in the preparation of this document.

Federal Emergency Management Agency

Reviewers	Experience and Expertise	Role in Preparation
Castaldi, Duane	Regional Environmental Officer	Project Review
Cunningham, Maureen	Regional Counsel	Legal Review
Schroeder, Leslie	Environmental Specialist	Project Review

CDM Smith

Preparers	Experience and Expertise	Role in Preparation
Argiroff, Emma	Environmental Planner	NEPA Documentation Review
Giordano, Brock	Senior Cultural Resources Specialist	NEPA Documentation
Gledhill, Greta	Environmental Planner	NEPA Documentation
Fogler, Wilson	Biologist	NEPA Documentation
Roberts, Jessica	Environmental Planner	NEPA Documentation
Stenberg, Kate	Senior NEPA Specialist	Quality Assurance/Quality Control Review
Webb, Brandon	Lead Environmental Planner	NEPA Documentation Review

SECTION 9. References

Audubon Great Lakes. 2024. "Birds." Accessed February 26, 2024, https://gl.audubon.org/birds.

Code of Federal Regulations (C.F.R.). 2024. Part 241, Appendix C. Accessed May 20, 2024. https://www.eC.F.R..gov/current/title-49/subtitle-B/chapter-II/part-241.

Cornell Lab of Ornithology. 2024a. All About Birds – Bald Eagle Sightings Map. Accessed February 26, 2024, https://www.allaboutbirds.org/guide/Bald_Eagle/maps-sightings#.

———. 2024b. eBird. Golden Eagle. Accessed February 26, 2024, https://ebird.org/species/goleag.

Davenport, F.V., M. Burke, N.S. Diffenbaugh. 2021. Contribution of historical precipitation change to U.S. flood damages. Proceedings of the National Academy of Sciences, May 21, 2021. Accessed January 23, 2023. Available at: https://www.pnas.org/doi/10.1073/pnas.2017524118.

Dewitz, J., and U.S. Geological Survey (USGS). 2021. National Land Cover Database (NLCD) 2019 Products (ver. 2.0, June 2021): U.S. Geological Survey data release. Accessed June 27, 2024. https://doi.org/10.5066/P9KZCM54.

Farmland Information Center. 2024. 2017 National Resources Inventory. Accessed June 7, 2024. https://farmlandinfo.org/statistics/national-resources-inventory/.

Federal Emergency Management Agency (FEMA). Federal Emergency Management Agency (FEMA). Statutorily Excluded from NEPA. Accessed January 31, 2024. https://www.fema.gov/emergency-managers/practitioners/environmental-historic/laws/nepa/statutory-exclusions.

———. 2024b. FEMA Community Status Book. Accessed January 22, 2024. https://www.fema.gov/flood-insurance/work-with-nfip/community-status-book.

———. 2023a. Hazard Mitigation Assistance Program and Policy Guide. Version 1.1. Federal Enterprise Architecture Number: FP-206-21-0001. Effective March 23, 2023. Updated September 22, 2023. Accessed May 20, 2024. https://www.fema.gov/sites/default/files/documents/fema_hma_guide_08232023_v1.pdf.

———. 2023b. FEMA Declared Disaster Search 2010-2023, Region 5, Incident Type: Flood. https://www.fema.gov/disaster/declarations?field_dv2_declaration_date_value%5Bmin%5D=2010&field_dv2_declaration_date_value%5Bmax%5D=2023&field_dv2_declaration_type_value=All&field_dv2_incident_type_target_id_selective=49112&field_dv2_state_territory_tribal_value%5B0%5D=IL&field_dv2_state_territory_tribal_value%5B1%5D=IN&field_dv2_state_territory_tribal_value%5B2%5D=MI&field_dv2_state_territory_tribal_value%5B3%5D=MN

&field_dv2_state_territory_tribal_value%5B4%5D=OH&field_dv2_state_territory_tribal_value%5B5%5D=WI&page=2.

———. 2020. Public Assistance Program and Policy Guide. Version 4. Effective June 1, 2020. FP-104-009-2. Accessed May 20, 2024. https://www.fema.gov/sites/default/files/documents/fema_pappg-v4-updated-links_policy_6-1-2020.pdf.

Great Lakes Restoration Initiative (GLRI). 2019. Great Lakes Restoration Initiative Action Plan III: Fiscal Year 2020-2024. Accessed August 7, 2024. https://www.epa.gov/sites/default/files/2019-10/documents/glri-action-plan-3-201910-30pp.pdf.

Hole, Francis D. 1976. Soils of Wisconsin. Accessed May 1, 2024. https://wgnhs.wisc.edu/pubshare/B087.pdf.

Illinois Department of Natural Resources (Illinois DNR). 2024a. Coastal Management Program. Accessed February 13, 2024, https://dnr.illinois.gov/cmp.html.

———. 2024b Habitat Information. Accessed July 20, 2024. https://dnr.illinois.gov/education/cdhabitatmain.html.

Illinois Department of Transportation (IDOT). 2024. Transportation System Network Overview. Accessed March 13, 2024. https://idot.illinois.gov/transportation-system/network-overview.html.

———. 2018. Bureau of Local Roads and Streets Manual. Accessed March 13, 2024. https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/doing-business/manuals-guides-and-handbooks/highways/local-roads-and-streets/local-roads-and-streets-manual.pdf.

Illinois Environmental Protection Agency (IEPA). Illinois Integrated Water Quality Report and Section 303(d) List, 2020/2022. Accessed January 15, 2024. https://epa.illinois.gov/content/dam/soi/en/web/epa/topics/water-quality/watershed-management/tmdls/documents/2020-2022-ir-final-6-01-22.pdf.

Illinois Natural History Survey. 2021. INHS Fish Collection. Accessed February 26, 2024, https://fish.inhs.illinois.edu/illinois-species-list/.

iNaturalist. 2024. Observations. Accessed February 26, 2024, https://www.inaturalist.org/observations.

Indiana Audubon. 2022. Backyard Birds of Indiana. Accessed February 26, 2024, https://indianaaudubon.org/backyard-birds-of-indiana/.

Indiana Department of Natural Resources (Indiana DNR). 2024a. About the Lake Michigan Coastal Program. Accessed February 13, 2024, https://www.in.gov/dnr/lake-michigan-coastal-program/about/.

———. 2024b. Fishes of Indiana List. Accessed February 26, 2024, https://www.in.gov/dnr/fish-and-wildlife/nongame-and-endangered-wildlife/fish-and-freshwater-mussels/fishes-of-indiana-list/.

———. 2024c. Aquatic Invasive Species – Invertebrates. Accessed April 1, 2024, https://www.in.gov/dnr/rules-and-regulations/invasive-species/aquatic-invasive-species-invertebrates/.

Indiana Department of Transportation (INDOT). 2024. INDOT Facts. Accessed March 13, 2024. https://www.in.gov/indot/about-indot/indot-facts/.

———. 2021. Indiana State Rail Plan. Accessed March 13, 2024. https://www.in.gov/indot/files/INDOT_SRP_Combined_FINAL_Nov-2021-INDOT-website.pdf.

Indiana Division of Fish and Wildlife. 2004 Accessed September 3, 2024. https://www.in.gov/dnr/fish-and-wildlife/files/riparian.pdf.

Lake County Stormwater Management Commission. 2014. A Citizen's Guide to Riparian Area Management. Accessed February 26, 2024, https://www.lakecountyil.gov/DocumentCenter/View/2993/Riparian-Area-Management-a-Citizens-Guide-PDF.

Michigan Department of Environment Great Lakes and Energy (EGLE). 2024. State and Federal Wetland Regulations. Accessed August 7, 2024. https://www.michigan.gov/egle/about/Organization/Water-Resources/Wetlands/state-and-federal-wetland-regulations#:~:text=If%20EGLE%20determines%20that%20an%20application%20under%20Michigan%27s,submitting%20comments%20on%20the%20federal%20position%20to%20EGLE.

———. 2022. Water Quality and Pollution Control in Michigan 2022. Accessed January 15, 2024. https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/WRD/SWAS/IR/2022-Integrated-Report.pdf?rev=8456a1fced4b4fd390f694e1c841a308&hash=3776E3701E2856066521FD8892896455.

———. 2020. Coastal Zone Boundary Maps. Accessed September 11, 2024, https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/WRD/Coastal-Management/coastal-zone-maps.pdf?rev=5f849175a60742c8ab9106fa415970a5.

———. 2019. Michigan Coastal Zone Management Area. Metadata. Accessed September 11, 2024, https://www.mcgi.state.mi.us/AGOOpenData/Metadata/Reference/Coastal_Zone_Management_Area.html.

———. 2017. Michigan Coastal Zone Management Area. Accessed February 13, 2024, https://www.mcgi.state.mi.us/AGOopendata/metadata/reference/Reference.CSS_SDE_ADMIN.Coastal_Zone_Management_Area.html#:~:text=Generally%2C%20the%20Michigan%20Coastal%20Zone%20Management%20Boundary%20extends.

Michigan Department of Natural Resources (Michigan DNR). 2024a. Fish Species. Accessed February 26, 2024, https://www.michigan.gov/dnr/education/michigan-species/fish-species.

———. 2024b. Michigan Mammals. Accessed February 26, 2024, https://www.michigan.gov/dnr/education/michigan-species/mammals.

Michigan Department of Transportation (MDOT). 2024. Rail. Accessed March 13, 2024. https://www.michigan.gov/mdot/travel/mobility/rail.

Michigan Highways. 2024a. Michigan's Route Systems. Accessed March 13, 2024. https://www.michiganhighways.org/route_systems.html#Intercounty.

———. 2024b. Forest Highways. Accessed March 13, 2024. https://michiganhighways.org/other/forest_highways.html.

Michigan Invasive Species. 2024. Michigan's Invasive Species Watch List. 2024. Accessed April 1, 2024, https://www.michigan.gov/invasives/-/media/Project/Websites/invasives/Documents/ID-Report-resources/IS-watch-list.pdf?rev=88270679606f47d983b92af88e65dc26&hash=8993DD80C531097BF7C3D546C54ACAA6.

Midwest Invasive Plant Network. 2024. Midwest Invasive Plant List. Accessed July 20, 2024. https://www.mipn.org/plantlist/.

Minnesota Department of Natural Resources (Minnesota DNR). 2024a. Fish Species. Accessed February 26, 2024, https://www.michigan.gov/dnr/education/michigan-species/fish-species.

———. 2024b. Native Plant Community Classification. Accessed July 20, 2024. https://www.dnr.state.mn.us/npc/classification.html.

———. 2024c. Mammals in Minnesota. Accessed February 26, 2024, https://www.dnr.state.mn.us/mammals/index.html.

———.1999. Combined Coastal Management Program and Final Environmental Impact Statement for the State of Minnesota. Accessed on February 13, 2024, https://files.dnr.state.mn.us/waters/lakesuperior/feis/mlscp_feis.pdf.

Minnesota Department of Transportation (MnDOT). 2024. Freight Railroads. Accessed March 20, 2024. https://www.dot.state.mn.us/ofrw/railroad/index.html#:~:text=MnDOT%20coordinates%20rail%20crossing%20safety,rail%20grade%20crossings%20throughout%20Minnesota.

Minnesota Pollution Control Agency (MPCA). 2023. 2024 Minnesota Water Quality. Accessed January 17, 2024. https://www.pca.state.mn.us/sites/default/files/wq-s7-54.pdf.

MinnesotaGO. 2024. Minnesota State Highway Investment Plan. Accessed March 13, 2024. https://www.minnesotago.org/mnship-plan.

National Levee Database. 2024. Accessed July 2024. https://levees.sec.usace.army.mil/.

National Marine Fisheries Service (NMFS). 2022. ESA Section 7 Mapper: NOAA Fisheries Greater Atlantic Region. Version 2.1. Accessed February 5, 2024, https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=a85c0313b68b44e0927b51928271422a.

National Oceanic and Atmospheric Administration (NOAA). 2024a. Coastal Zone Management Act. Accessed February 12, 2024, https://coast.noaa.gov/czm/act/.

———. 2024b. The Coastal and Estuarine Land Conservation Program. Accessed February 12, 2024, https://coast.noaa.gov/czm/landconservation/.

———. 2024c. Office for Coastal Management: National Estuarine Research Reserves. Accessed February 15, 2024, https://coast.noaa.gov/nerrs/.

———. 2021. Coastal and Estuarine Land Conservation Program (CELCP) Projects. Accessed February 15, 2024, https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=2c7d8728373e4e3f8bb6944c3fe15fc6.

———. 2019. Great Lakes: Infrastructure and the Built Environment. July 11, 2019. Accessed January 16, 2024. https://toolkit.climate.gov/regions/great-lakes/infrastructure-and-built-environment.

National Park Service (NPS). 2024. National Register Database and Research - National Register of Historic Places (U.S. National Park Service) (nps.gov), Accessed July 2024. https://www.nps.gov/subjects/nationalregister/database-research.htm#table.

———. 2023a. Invasive and Non-Native Species: Midwest. Updated December 13, 2023. Accessed February 22, 2024, https://www.nps.gov/subjects/invasive/mw.htm#:~:text=Targeted%20Plant%20Species%20Watchlist%20for%20the%20Midwest%201,8%20Canada%20Thistle%20%28%20Cirsium%20arvense%29%20More%20items.

———. 2023b. *The Secretary of the Interior's Standards for the Treatment of Historic Properties - Using the Standards and Guidelines for Preservation, Rehabilitation, Restoration & Reconstruction.* Accessed July 2024, https://www.nps.gov/orgs/1739/secretary-standards-treatment-historic-properties.htm.

Ohio Department of Natural Resources (Ohio DNR). 2024a. Fish. Accessed February 26, 2024, https://ohiodnr.gov/discover-and-learn/animals/fish.

———. 2024b. Mammals. Accessed February 26, 2024, https://ohiodnr.gov/discover-and-learn/animals/mammals.

———. 2007. Combined Coastal Management Program and Final Environmental Impact Statement for the State of Ohio. Volume I. Accessed February 13, 2024, https://ohiodnr.gov/static/documents/coastal/OhioCoastalManagementProgramDocument.pdf.

Ohio Department of Transportation (ODOT). 2023. Roadway Infrastructure Maintenance Responsibility Manual. Accessed March 14, 2024. https://www.transportation.ohio.gov/programs/maintenance-operations/rimr/rimr.

Ohio Environmental Protection Agency (OEPA). 2022. Ohio 2022 Integrated Water Quality Monitoring and Assessment Report. Accessed January 17, 2024. https://epa.ohio.gov/static/Portals/35/tmdl/2022intreport/Full-2022-IR.pdf.

The Ohio State University (OSU). 2024. Soil Health Assessment: Soil Type & History. Accessed May 1, 2024. https://soilhealth.osu.edu/soil-health-assessment/soil-type-history.

Public Utilities Commission of Ohio. 2024. Transportation: Railroad. Accessed: July 29, 2024. Available at: https://puco.ohio.gov/transportation/railroad.

Purdue University. 2004. Indiana Soil and Landscape Evaluation Manual. Accessed May 1, 2024. https://www.extension.purdue.edu/extmedia/ay/ay-323.pdf.

Sommers, Lawrence M. 1984. Michigan: A Geography. Accessed May 1, 2024. https://project.geo.msu.edu/geogmich/soils.html.

U.S. Army Corps of Engineers (USACE). 2022. Floodwalls and Other Hydraulic Retaining Walls. August 1, 2022. Accessed June 26, 2004. https://www.publications.usace.army.mil/Portals/76/Users/182/86/2486/EM%201110-2-2502.pdf.

_____. 2000. Design and Construction of Levees. April 30, 2000. Accessed June 26, 2024. https://www.publications.usace.army.mil/portals/76/publications/engineermanuals/em_1110-2-1913.pdf.

U.S. Census Bureau. 2021. 2017-2021 American Community Survey 5-Year Estimates. Table IDs: B03002 and C17002. Accessed January 4, 2024. https://data.census.gov/all.

U.S. Department of Agriculture (USDA). 1984. Soils of Illinois. Accessed May 1, 2024. https://efotg.sc.egov.usda.gov/references/Agency/IL/Soils_of_Illinois_Bulletin_778.pdf.

U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). 2024. Soil Explorer Map. Accessed June 6, 2024. https://soilexplorer.net/.

———. 2022. Farmland Conversion Impact Rating Form. Accessed April 10, 2024. https://www.nrcs.usda.gov/sites/default/files/2022-06/AD1006.pdf.

———. 2018. Illinois Suite of Maps. Accessed May 20, 2024. https://www.nrcs.usda.gov/conservation-basics/conservation-by-state/illinois/illinois-suite-of-maps.

U.S. Department of Transportation. 2024, About FHWA. Accessed March 20, 2024. https://highways.dot.gov/about/about-fhwa.

———. 2016. State DOT's Responsibilities. Accessed June 4, 2024. https://www.transportation.gov/civil-rights/civil-rights-awareness-enforcement/state-dots-responsibilities#:~:text=State%20Departments%20of%20Transportation%20(DOTs,from%20various%20Federal%2Daid%20programs.

U.S. Environmental Protection Agency (EPA). 2024a. Tribes and Water Quality Standards. Accessed January 9, 2024. https://www.epa.gov/wqs-tech/tribes-and-water-quality-standards.

_____. 2024b. How's My Waterway. Accessed October 3, 2024. https://mywaterway.epa.gov/

_____. 2024c. Sole Source Aquifer Mapper. Accessed January 14, 2024. https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b

_____. 2024d. Current Nonattainment Counties for All Criteria Pollutants. Accessed March 4, 2024. https://www3.epa.gov/airquality/greenbook/ancl.html

_____. 2024e. EnviroMapper. Search Envirofacts by State. Accessed February 20, 2024. https://geopub.epa.gov/myem/efmap/index.html?ve=8,39.48927307803936,-89.32910119265622

——. 2023a. Ecoregions. Accessed February 12, 2024, https://www.epa.gov/eco-research/ecoregions.

U.S. Fish and Wildlife Service (USFWS) 2024a. Bald Eagle. Accessed February 26, 2024, https://www.fws.gov/species/bald-eagle-haliaeetus-leucocephalus.

_____. 2024b. Golden Eagle. Accessed February 26, 2024, https://www.fws.gov/species/golden-eagle-aquila-chrysaetos.

_____. 2024c. Information for Planning and Consultation Tool. Accessed February 9, 2024, https://ipac.ecosphere.fws.gov/.

——. 2016. "Emissions Standards Reference Guide: All EPA Emissions Standards." Accessed April 24, 2024, https://www.epa.gov/emission-standards-reference-guide/all-epa-emission-standards.

——. 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. March. Accessed July 29, 2024. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi/2000L3LN.PDF?Dockey=2000L3LN.PDF.

U.S. Geological Survey (USGS). 2024. Physiographic divisions of the conterminous U.S. Accessed April 11, 2024. https://www.sciencebase.gov/catalog/item/631405bbd34e36012efa304e.

University of Minnesota Extension. 2021. Soil Orders and Suborders in Minnesota. Accessed May 1, 2024. https://extension.umn.edu/soil-management-and-health/soil-orders-and-suborders-minnesota#alfisols-1383911.

U.S. Forest Service. 2024. "Invasive Plants." Accessed February 5, 2024. https://www.fs.usda.gov/wildflowers/invasives/index.shtml.

Wisconsin Department of Administration. 2024. Wisconsin Coastal Management Program. Accessed February 15, 2024, https://doa.wi.gov/Pages/LocalGovtsGrants/CoastalManagement.aspx.

Wisconsin Department of Natural Resources (WDNR). 2024. Wisconsin Fish Species List. Accessed February 26, 2024, https://dnr.wisconsin.gov/sites/default/files/topic/Fishing/Species_wifish.pdf.

——. 2022. Wisconsin Water Quality Report to Congress, 2022. Accessed January 17, 2024. https://dnr.wisconsin.gov/topic/SurfaceWater/Congress.html.

——. 2015. Wisconsin Invasive Species Program Report. Accessed April 1, 2024, https://p.widencdn.net/lngqpb/SS1149.

Wisconsin Department of Transportation (WisDOT). 2021. Facilities Development Manual: State Trunk Highways. Accessed March 14, 2024. https://wisconsindot.gov/rdwy/fdm/fd-04-05.pdf.

Wisconsin Office of the Commissioner of Railroads. 2024. FAQs. Accessed March 13, 2024. https://ocr.wi.gov/Pages/Home.aspx.

World Atlas. 2024a. Maps of Illinois. Updated January 2024. Accessed March 11, 2024. https://www.worldatlas.com/maps/united-states/illinois.

———. 2024b. Maps of Indiana. Updated January 2024. Accessed March 11, 2024.

———. 2024c. Maps of Michigan. Updated January 2024. Accessed March 11, 2024. https://www.worldatlas.com/maps/united-states/michigan.

———. 2024d. Maps of Minnesota. Updated January 2024. Accessed March 11, 2024. https://www.worldatlas.com/maps/united-states/minnesota.

———. 2024e. Maps of Ohio. Updated January 2024. Accessed March 11, 2024. https://www.worldatlas.com/maps/united-states/ohio.

———. 2024f. Maps of Wisconsin. Updated January 2024. Accessed March 11, 2024. https://www.worldatlas.com/maps/united-states/wisconsin.

Appendix A – Principles, Requirements, and Guidelines

1. Principles, Requirements, & Guidelines

Under the Principles, Requirements, and Guidelines (PR&G), in addition to meeting the project purpose and need, the alternatives for water resource projects must also be evaluated against their ability to achieve the Federal Objective and to conform to the guiding principles. The Federal Objective specifies that federal water resources investments shall reflect national priorities, encourage economic development, and protect the environment by:

1. Seeking to maximize economic development;
2. Seeking to avoid the unwise use of floodplain and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used; and
3. Protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems.

The guiding principles for the PR&G analysis are five overarching concepts that the federal government seeks to promote through federal investments in water resources. The guiding principles are: (1) Healthy and Resilient Ecosystems, (2) Economic Development, (3) Floodplains, (4) Public Safety, (5) Watershed Approach (FEMA 2018). The guiding principles are key concepts that the potential consequences of the alternatives are evaluated against and are often framed in terms of ecosystem services that may be provided or affected by a project. This appendix provides the watershed context for the study area and a model of ecosystem services potentially provided by the Proposed Action. A comparison of the alternatives against the Guiding Principles is shown in **Table A-1.**

This PR&G analysis provides an overview of watershed conditions within the six-state study area and establishes a framework for the evaluation of levee projects, specifically earthen levees and floodwalls. Because a PR&G analysis is intended to evaluate how a proposed project may affect water resources and the services provided by those resources within the context of a specific watershed and other activities in that watershed, it is not possible to complete the evaluation on a programmatic basis. The PR&G is intended to provide a consistent framework for evaluating water resource projects that considers public benefits and promotes consistency, resilience, and coordination among federal agencies' investments from a watershed perspective, This programmatic evaluation identifies the larger environmental trends and context that would affect all proposed projects within the study area and provides a conceptual framework for how levee flood mitigation projects may affect ecosystem services and the guiding principles. This framework can be used to expeditiously conduct project level reviews when applying the PEA to specific proposed action.

The first two steps of the PR&G analysis, defining the purpose and need and describing a range of alternatives, are completed in the PEA in Sections 2 and 3, respectively. The third step, identify existing conditions, is presented programmatically in Section 4 of the PEA; however, existing conditions will also need to be assessed on a project specific basis to identify any conditions not described in the PEA and to identify the project-specific watershed conditions. Specific watershed

considerations may include existing watershed plans; other water resource investment projects, needs, or trends in the watershed; or project area communities that may be affected. The future conditions of the study area, the fourth step, is a description of the future under the no action alternative. The no action alternative is evaluated in the PEA. The fifth step is to evaluate the proposed action, which is presented in Section 4 of the PEA. If there are watershed specific, existing conditions relevant to the PR&G, then a brief supplemental analysis would be needed to fully assess the effects of a proposed project against the guiding principles and for consistency with the Federal Objective.

1.1. Watershed Context

In compliance with the PR&G analysis, the watershed context for the Proposed Action provides additional insight regarding the need for this project as well as other water resources investments proposed within the vicinity. The study area for this PEA encompasses four regional watersheds, the Upper Mississippi, Ohio, Great Lakes, and the Souris Red Rainy watersheds, and portions of two additional regional watersheds. The Upper Mississippi watershed encompasses a drainage area of approximately 189,000 square miles in Illinois, Minnesota, Wisconsin, and two states outside of the project area, Iowa and Missouri (American Sustainable Business Council 2024) and includes approximately 1,200 miles of navigable river waters (Wisconsin DNR 2024). The Ohio watershed encompasses approximately 75,000 square miles within the study area which includes 981 miles of the Ohio River (Ohio River Foundation 2024). The Great Lakes basin includes approximately 155,000 square miles within the study area (Great Lakes Commission 2024). Lastly, the Souris Red Rainy Watershed encompasses approximately 15,000 square miles in Minnesota and approximately 225 miles of the Red River. These regional watersheds are the largest geographic area in the U.S. Geological Service's classification of hydrologic units. Water resource planning and project development typically occurs at a smaller scale; often in areas represented by 8-, 10-, or 12-digit hydrologic unit codes where the larger numbers represent smaller geographic areas. While the regional scale watersheds are useful for providing some context and insights into general trends, understanding of the project-scale watershed area will be necessary to identify project-specific PR&G considerations.

Flooding within these watersheds are common occurrences that cause extensive damage on infrastructure in and near waterbodies that could damage the watershed health. There is an increase in the incidence and frequency of heavy precipitation and storm events, in the past 30 to 40 years, resulting in increased stream flows and Great Lake storm surge, causing an increase flooding events. Annual precipitation has increased 5 percent to 15 percent from the first half of the last century (1901 to 1960) compared to the present day (1986 to 2015). Winter and spring precipitation is projected to increase by up to 30 percent by the end of this century. Heavy precipitation events have increased in frequency and intensity since 1901 and are projected to increase throughout this century (Easterling et al. 2017). The increased frequency and intensity of storms and stream flows has also increased the levels of flooding in these watersheds and it is expected to continue to worsen.

1.2. Conceptual Model for Ecosystem Services

The conceptual model for the PR&G principles shows how changes in ecological conditions resulting from the implementation of the Proposed Action would affect the provision of ecosystem services and their linked societal benefits. In an ecosystem services assessment, the conceptual diagram provides a systematic approach to connect ecological conditions to societal benefits. It also considers how and which changes in the environment affect benefits to people. When causal connections to people are not made explicit, it is unclear whether and how each ecological change would result in changes to social benefits, and important changes to societal benefits may be left out of the analysis.

Figure A-1 shows the general model for levee projects. The model—also known as a causal chain—links changes caused by an external stressor or intervention (i.e., construction of stream mitigation projects) through the ecological system to socioeconomic and human well-being outcomes. The conceptual model provides a visual representation of cause and effect but does not indicate the direction of the effect or the change (e.g., increase or decrease). More integral or stronger connections are emphasized in the model with larger boxes and thicker connector lines.

The conceptual model for the Proposed Action was developed by first considering how the Proposed Action would affect the ecological conditions of the project area. Next, these anticipated changes in ecological conditions were considered as to whether and how they would change the delivery of ecosystem services currently provided within the project area, and how changes in the delivery of ecosystem services could affect benefits or costs to individuals or groups within the project area and the larger watershed (FEMA 2018).

As shown in Figure A-1, the Proposed Action would change ecological conditions by potentially changing stream banks and flood zones. Alteration of a streambanks and flood zones would affect water flows and floodplain functions to varying degrees. Each of those functions contributes to one or more societal benefits. As the change in water flow and floodplain functions, the corresponding societal benefits are impacted to a greater or lesser degree and effects may be positive or negative. The model provides a conceptual visualization of the connections and the magnitude of the potential changes but does not indicate whether changes would be considered beneficial or adverse. The model does show that the societal functions most likely to be affected by the proposed stream work are those most closely aligned with the purpose and need for the Proposed Action, such as public safety and property damage.

Levee projects would meet the purpose and need by reducing flooding. These projects would have a beneficial effect on water quality, including floodplain and wetland health, resulting in a resilient ecosystem. Reduced flooding would have a positive impacts on the community by reducing the associated insurance costs, reducing property damage costs, and reducing risks to public health and safety. Additionally, levee projects would protect important public services that are needed within the community while also increasing employment and recreational opportunities. Therefore, the Proposed Action meets the PR&G federal objective and follows the guiding principles.

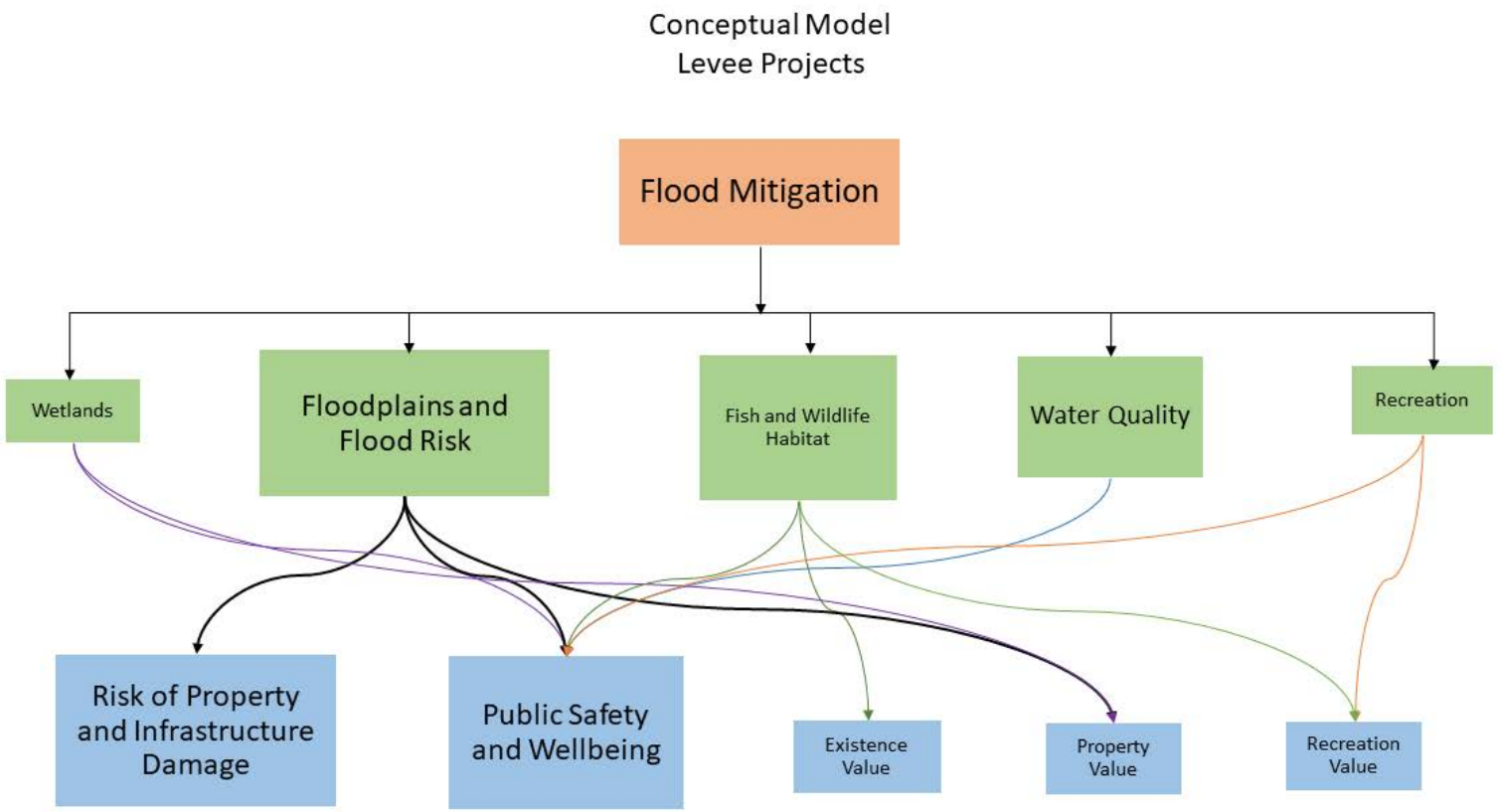

Figure A-1. Conceptual Model for Levee Projects

Construction of levee projects (the Proposed Action) would clearly meet the purpose and need by reducing flood risks throughout the Great Lakes region, thus resulting in positive impacts on communities by reducing risks to public health and safety, associated flood insurance costs, and reducing property damage and costs. Additionally, the Proposed Action could potentially protect important public services that are needed within the community while also increasing employment and recreational opportunities. Therefore, the Proposed Action meets the PR&G federal objective and follows the guiding principles. The Proposed Action was determined to be the best alternative to meet the purpose and need for streambank stabilization and naturalization projects.

1.3. Interplay of Ecosystem Services and Societal Benefits and Costs

The FEMA PR&G Agency-Specific Procedures (FEMA 2018) require that impacts of the Proposed Action be analyzed using an ecosystem services approach. Ecosystem services are benefits that flow from nature to people. These services include direct and indirect contributions, including the economic and social benefits, that ecosystems provide to the environment and human population. Changes in the ecological condition due to the Proposed Action would affect ecosystem services and their linked societal benefits or costs. Ecosystem services are categorized into three general types:

1. Provisioning services, which refer to the food, fuel, fiber, and clean water that ecosystems provide.
2. Regulating services, which refer to the benefits obtained from the regulation of ecosystem processes.
3. Cultural services, which refer to the benefits ecosystems confer that do not directly relate to human physical health or material well-being.

Ecosystem services as shown in the conceptual model were analyzed programmatically for impacts on watersheds that would be impacted by stream work within the six states. However, when considering a specific project, reviewers should evaluate potential effects against the local watershed and site-specific conditions and identify if there are any impacts not described below.

- **Wetlands** provide a variety of ecosystem services that encompass both provisioning and regulating services. Wetlands provide food, fiber, and clean water; regulate water supply (e.g., flood retention, base stream flow support); and sequester carbon. Wetlands in the study area would be adversely affected if they were directly disturbed or impacted by fill or other construction activities within or adjacent to wetlands. Construction related impacts can also include increased sedimentation or turbidity within wetland waters. If levee projects disconnect nearby wetlands from other water sources, their hydrology could be adversely impacted. Levee projects would likely prevent contaminants carried by inland flooding from entering wetlands, protecting wetland services. Healthy wetlands would benefit the public safety and wellbeing by improving water quality, providing erosion control, and flood abatement. These services would provide protection to adjacent properties and recreational opportunities that would also benefit property values and public wellbeing.

- **Floodplains** provide provisioning, regulating, and cultural ecosystem services. Floodplains are prime locations for food and fiber production; they regulate flooding; and historically are the preferred location for human settlements due to their position along streams and rivers that provided connectivity and access to other settlements and resources. Construction activities could potentially release of sediments and pollutants into the floodplain. In the long term, levees would reduce inland flooding, thus decreasing the release of pollutants within the floodplain. Furthermore, levees would reduce flood-related damage to infrastructure and flood-related health and safety risks to the community; thereby benefiting the social benefits of public safety and wellbeing and property values.

- **Fish and wildlife habitat** provides provisioning and cultural services. Construction activity could result in the injury or death of individuals during project implementation or the loss or degradation of habitat. Nesting bird species protected by the Migratory Bird Treaty Act could be negatively impacted by construction activities that require the removal of vegetation. Over the long term, reduced flooding would improve both aquatic and terrestrial habitats by reducing the amount of contaminated flood waters from entering the aquatic habitat and protecting habitat from flood related damage. This in turn would provide protection for the public and increase recreation, existence, and property values as healthy habitats support a diversity of fish and wildlife and creates a healthy ecosystem for people and supports the value of nature itself.

- Levee projects would directly affect **water quality**, a provisioning service. Water quality in the study area could be affected in the short term by construction-related turbidity, stormwater runoff, or pollutants entering the water for levee projects that require in water work. In the long term, water quality may be improved by reducing the amount of contaminated flood waters entering waterways. Reducing flooding would aid in avoiding the mobilization of pollutants from the urban environment. Improved water quality would benefit community health and wellbeing by providing clean water and reducing the risk of water-related contamination.

- **Recreation** is a cultural ecosystem service provided by waterways and could include direct contact recreation (e.g., swimming) and indirect contact recreation (e.g., boating, walking along streams and rivers, fishing). Recreation could be impacted by changes in access both during construction of projects and by structural changes in levee construction. Improved flood management at recreational facilities would improve access for recreational activities by reducing future damage to these facilities. Improved recreational value and opportunities in waterways would also benefit public health and wellbeing.

1.4. PR&G Principles Impact Analysis Summary

The Federal Objective specifies that federal water resources investments shall reflect national priorities, encourage economic development, and protect the environment by: seeking to maximize economic development; seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used; and protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems.

Table A-1 provides a summary of the potential impacts on ecosystem services from each alternative and their linked societal benefits.

Table A-1. PR&G Guiding Principles for the No Action and Proposed Action Impacts

PR&G Guiding Principles	No Action Alternative	Proposed Action
Healthy and Resilient Ecosystems	Ecosystems in and near project areas would continue to experience flood related risks from storm events that would be made worse by increased storm intensity.	The Proposed Action would provide flood mitigation thereby reducing flood-related damage to vegetation and the spread of pollution carried by floodwaters in and downstream of project sites.
Economic Development	Homes and businesses in project vicinities would continue to be susceptible to flood related damage that would result in economic disruptions and require funds to repair damage.	The Proposed Action would mitigate flooding, reducing the amount of future spending required for insurance and repairs. The levee projects would also reduce flood related road closures and utility outages, resulting in fewer economic disruptions.
Floodplains	Existing floodplains would be at risk from erosion related sedimentation and pollution washing into them. Facilities and infrastructure would continue to be vulnerable to flood damage.	The Proposed Action could improve the function of floodplains by reducing the amount contaminated flood waters from entering the floodplain. The Proposed Action would also provide additional flood mitigation, reducing flood risk to facilities and infrastructure.
Public Safety	Public safety in and near project areas would continue to be threatened by erosion and flooding including the potential for adverse impacts on critical facilities.	Improved public safety resulting from a reduction flood risk, a reduction of possible pollutants and hazardous materials that could be transported by floodwaters into streams, and a reduction in the likelihood that public services and critical facilities in the benefit area would be damaged or disrupted by flood damage.
Watershed Approach	There would be a continued risk of flood related sediments and pollutants entering watersheds. The sediments and pollutants impacts would likely be localized due to the size constraint of the Proposed Action.	The Proposed Action is expected to provide flood risk reduction within the study area. Levee projects would reduce sediments and pollutants entering watersheds. This would have a localized benefit on the health of watershed as the size of the projects allowed under the Proposed Action; it would likely not have a regional impact on watershed health. Where watershed planning has occurred, the Proposed Action would likely be consistent with the watershed approach. This principle is difficult to assess programmatically, and individual projects would need to be evaluated for consistency with existing watershed approaches.

The Proposed Action would be consistent with the PR&G Federal Objective that water resource investments shall reflect national priorities, encourage economic development, and protect the environment because it would reduce erosion and flood related damage within floodplains, which would promote economic development by lowering damage costs and improving natural functions. The Proposed Action would also avoid the unwise use of floodplains, minimize adverse impacts and vulnerabilities, and protect the functions of natural systems by avoiding impacts on functional floodplain habitats to the maximum extent possible and mitigating remaining impacts on functional floodplain habitats within each project site.

1.5. References

American Sustainable Business Council. 2024. Clean Water in the Upper Mississippi River Basin: Economic Importance, Threats, and Opportunities. Accessed June 2, 2024. https://www.asbnetwork.org/sites/main/files/file-attachments/asbc-umrb-whitepaperf.pdf

Federal Emergency Management Agency (FEMA). 2018. Handbook on FEMA's Agency Specific Procedures for the Principle, Requirements, and Guidelines (PR&G) Analysis. Accessed May 29, 2024. https://www.fema.gov/sites/default/files/2020-07/fema_ehp_instructions_implementation_2018.pdf

Great Lakes Commission. 2024. Great Lakes GIS. Accessed June 3, 2024. https://www.glc.org/greatlakesgis

Ohio River Foundation. 2024. The Ohio River and Its Watershed. Accessed June 3, 2024. https://ohioriverfdn.org/ohio-river/quick-facts/

Wisconsin Department of Natural Resources (Wisconsin DNR). 2024. Information About the Upper Mississippi River System. Accessed June 3 2024. https://dnr.wisconsin.gov/topic/UMR/About.html

U.S. Department of the Interior. 1978. Summary Appraisals of the Nation's Ground Water Resources Souris-Red-Rainy Region. Accessed June 3, 2024. https://pubs.usgs.gov/pp/0813k/report.pdf

Appendix B – EPA's Construction Emission Control Checklist

U.S. Environmental Protection Agency
Construction Emission Control Checklist

Diesel emissions and fugitive dust from project construction may pose environmental and human health risks and should be minimized. In 2002, EPA classified diesel emissions as a likely human carcinogen, and in 2012 the International Agency for Research on Cancer concluded that diesel exhaust is carcinogenic to humans. Acute exposures can lead to other health problems, such as eye and nose irritation, headaches, nausea, asthma, and other respiratory system issues. Longer term exposure may worsen heart and lung disease.[1] We recommend FEMA consider the following protective measures and commit to applicable measures in the Draft PEA.

Mobile and Stationary Source Diesel Controls

Purchase or solicit bids that require the use of vehicles that are equipped with zero-emission technologies or the most advanced emission control systems available. Commit to the best available emissions control technologies for project equipment in order to meet the following standards.

- On-Highway Vehicles: On-highway vehicles should meet, or exceed, the EPA exhaust emissions standards for model year 2010 and newer heavy-duty, on-highway compression-ignition engines (e.g., long-haul trucks, refuse haulers, shuttle buses, etc.).[2]
- Non-road Vehicles and Equipment: Non-road vehicles and equipment should meet, or exceed, the EPA Tier 4 exhaust emissions standards for heavy-duty, non-road compression-ignition engines (e.g., construction equipment, non-road trucks, etc.).[3]
- Locomotives: Locomotives servicing infrastructure sites should meet, or exceed, the EPA Tier 4 exhaust emissions standards for line-haul and switch locomotive engines where possible.[4]
- Marine Vessels: Marine vessels hauling materials for infrastructure projects should meet, or exceed, the latest EPA exhaust emissions standards for marine compression-ignition engines (e.g., Tier 4 for Category 1 & 2 vessels, and Tier 3 for Category 3 vessels).[5]
- Low Emission Equipment Exemptions: The equipment specifications outlined above should be met unless: 1) a piece of specialized equipment is not available for purchase or lease within the United States; or 2) the relevant project contractor has been awarded funds to retrofit existing equipment, or purchase/lease new equipment, but the funds are not yet available.

Consider requiring the following best practices through the construction contracting or oversight process:

- Establish and enforce a clear anti-idling policy for the construction site.
- Use onsite renewable electricity generation and/or grid-based electricity rather than diesel-powered generators or other equipment.
- Use electric starting aids such as block heaters with older vehicles to warm the engine.
- Regularly maintain diesel engines to keep exhaust emissions low. Follow the manufacturer's recommended maintenance schedule and procedures. Smoke color can signal the need for maintenance (e.g., blue/black smoke indicates that an engine requires servicing or tuning).
- Where possible, retrofit older-tier or Tier 0 nonroad engines with an exhaust filtration device before it enters the construction site to capture diesel particulate matter.
- Replace the engines of older vehicles and/or equipment with diesel- or alternatively-fueled engines

[1] https://kclpure.kcl.ac.uk/portal/files/6492297/coverBenbrahim_Tallaa_2012_Lancet_Oncology.pdf
[2] https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-heavy-duty-highway-engines-and-vehicles
[3] https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-nonroad-engines-and-vehicles
[4] https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-nonroad-engines-and-vehicles
[5] https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-nonroad-engines-and-vehicles

certified to meet newer, more stringent emissions standards (e.g., plug-in hybrid-electric vehicles, battery-electric vehicles, fuel cell electric vehicles, advanced technology locomotives, etc.), or with zero emissions electric systems. Retire older vehicles, given the significant contribution of vehicle emissions to the poor air quality conditions. Implement programs to encourage the voluntary removal from use and the marketplace of pre-2010 model year on-highway vehicles (e.g., scrappage rebates) and replace them with newer vehicles that meet or exceed the latest EPA exhaust emissions standards, or with zero emissions electric vehicles and/or equipment.

Fugitive Dust Source Controls

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative, where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
- Install wind fencing and phase grading operations where appropriate and operate water trucks for stabilization of surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

Occupational Health

- Reduce exposure through work practices and training, such as maintaining filtration devices and training diesel-equipment operators to perform routine inspections.
- Position the exhaust pipe so that diesel fumes are directed away from the operator and nearby workers, reducing the fume concentration to which personnel are exposed.
- Use enclosed, climate-controlled cabs pressurized and equipped with high-efficiency particulate air (HEPA) filters to reduce the operators' exposure to diesel fumes. Pressurization ensures that air moves from inside to outside. HEPA filters ensure that any incoming air is filtered first.
- Use respirators, which are only an interim measure to control exposure to diesel emissions. In most cases, an N95 respirator is adequate. Workers must be trained and fit-tested before they wear respirators. Depending on the type of work being conducted, and if oil is present, concentrations of particulates present will determine the efficiency and type of mask and respirator. Personnel familiar with the selection, care, and use of respirators must perform the fit testing. Respirators must bear a National Institute for Occupational Safety and Health approval number.

NEPA Documentation

- Per Executive Order 13045 on Children's Health,[6] EPA recommends the lead agency and project proponent pay particular attention to worksite proximity to places where children live, learn, and play, such as homes, schools, and playgrounds. Construction emission reduction measures should be strictly implemented near these locations in order to be protective of children's health.
- Specify how effects to sensitive receptors, such as children, elderly, and the infirm will be minimized. For example, locate construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners.

[6] Children may be more highly exposed to contaminants because they generally eat more food, drink more water, and have higher inhalation rates relative to their size. Also, children's normal activities, such as putting their hands in their mouths or playing on the ground, can result in higher exposures to contaminants as compared with adults. Children may be more vulnerable to the toxic effects of contaminants because their bodies and systems are not fully developed, and their growing organs are more easily harmed. EPA views childhood as a sequence of life stages, from conception through fetal development, infancy, and adolescence.

Appendix C – Threatened and Endangered Species List

Based on a review of the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation tool conducted in February 2024, 63 federally listed species and three species proposed for listing have the potential to occur within the states covered by this PEA, as summarized in the table below (USFWS 2024d). The study area overlaps designated critical habitat areas for 12 species, as summarized in the table below (USFWS 2024f). All federally listed or proposed species with potential to occur in the study area are under USFWS's jurisdiction; no federally listed species under the National Marine Fisheries Services' (NMFS's) jurisdiction have the potential to occur in the study area (NMFS 2022).

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
Mammals									
Canada lynx *Lynx canadensis*	Threatened	Yes (Final)			X	X C		X	Occupies boreal spruce-fir forest (taiga) featuring deep snow and dense horizontal forest that supports prey species (snowshoe hares [*Lepus americanus*]).
Gray bat *Myotis grisescens*	Endangered	No	X	X					Typically occurs in caves or cave-like structures year-round, although the species has been documented in dams, mines, quarries, and the underside of bridges.
Gray wolf *Canis lupus*	Threatened (MN) Endangered (MI, part of MN, and WI)	Yes (Final)			X	X C		X	Habitat generalists; can thrive in temperate forests, mountains, tundra, taiga, grasslands, deserts, and other areas.
Indiana bat *Myotis sodalis*	Endangered	Yes (Final)	X C	X C	X		X C		Winter habitat includes underground hibernacula including caves and abandoned mines. Summer habitat includes forested areas under the exfoliating bark of dead/dying trees.
Northern long-eared bat *Myotis septentrionalis*	Endangered	No	X	X	X	X	X	X	Hibernates in caves and mines in the winter. Roosts in the bark, cavities, or crevices of live and dead trees in the summer. May roost in structures such as barns and sheds.
Tricolored bat *Perimyotis subflavus*	Proposed Endangered	No	X	X	X	X	X	X	Primarily roosts in live and dead leaf clusters of live or recently dead deciduous hardwood trees during spring, summer, and fall. Hibernates in caves and mines in the winter.

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
Birds									
Eastern black rail *Laterallus jamaicensis ssp. Jamaicensis*	Threatened	No		X					Can occur in salt, brackish, and freshwater marsh habitats that are tidally or non-tidally influenced. Requires dense vegetative cover that allows movement under the canopy.
Piping plover *Charadrius melodus*	Endangered	Yes (Final)	X C	X C	X C	X C	X C	X C	Foraging habitat includes sandy mud flats, ephemeral pools, and seagrass beds. Nesting habitat includes unvegetated shorelines of alkaline lakes, reservoirs, or river sandbars.
Rufa red knot *Calidris canutus rufa*	Threatened	Yes (Proposed)	X	X	X[1]	X	X	X	Migration and overwintering habitat generally include coastal marine and estuarine habitats with exposed intertidal sediments.
Whooping crane *Grus americana*	Endangered (Experimental Population)	No	X	X	X	X	X	X	Can occupy a variety of aquatic habitats including coastal marshes, inland marshes, open ponds, wet meadows and rivers, and pastures/agricultural fields.
Reptiles									
Alligator snapping turtle *Macrochelys temminckii*	Proposed Threatened	No	X						Occurs in deep waters of large rivers, major tributaries, bayous, canals, lakes, and other freshwater aquatic habitats during the late summer and winter and occupy shallower waters in early summer.
Copperbelly water snake *Nerodia erythrogaster neglecta*	Threatened	No		X	X		X		Typically occurs in wetland complexes featuring shallow, isolated wetlands distributed within a forested upland habitat. Individuals aestivate in upland habitats.

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
Eastern massasauga *Sistrurus catenatus*	Threatened	No	X	X	X[2]		X	X	Occurs in shallow wetlands, wet prairies, marshes, and low areas along rivers and lakes as well as adjacent uplands.
Fish									
Pallid sturgeon *Scaphirhynchus albus*	Endangered	No	X						Inhabits large, deep turbid river channels, usually with strong currents and firm sand or gravel substrates.
Topeka shiner *Notropis topeka*	Endangered	Yes (Final)				X C			Suitable habitat includes pools (in or off-channel) with low flows, gravel substrates, and groundwater input.
Clams									
Clubshell *Pleurobema clava*	Endangered	No	X	X	X		X		Generally, occurs in clean, stable, coarse sand and gravel substrates in small to medium rivers/streams. Is often found just downstream of riffle areas.
Fanshell *Cyprogenia stegaria*	Endangered	No	X	X			X		Generally, occurs within gravel substrate in medium to large rivers of the Ohio River basin.
Fat pocketbook *Potamilus capax*	Endangered	No	X	X					Found in large rivers within a variety of substrates including silt, mud and sand, sticky mud, and/or a mixture of these substrates (Missouri Department of Conservation 2015).
Higgins eye (pearlymussel) *Lampsilis higginsii*	Endangered	No	X			X		X	Occupies stable substrates ranging from sand to boulders in large rivers. Does not occur in firmly packed clay, flocculent silt, organic material, concrete, or unstable sand. Occur in mussel beds that support a diversity of other mussel species.

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
Longsolid *Fusconaia subrotunda*	Threatened	Yes (Final)	X	X			X		Typically occurs in sand and gravel substrates within streams and small rivers. In large rivers, the species has been observed occupying coarse gravel and cobble substrates.
Northern riffleshell *Epioblasma rangiana*	Endangered	No	X	X	X		X		Generally thought to occur in riffles, but is also known to occur in slow-moving and more lentic habitats. Also known to occur in Lake Erie.
Orangefoot pimpleback (pearlymussel) *Plethobasus cooperianus*	Endangered	No	X						Occurs in moderate to large rivers in sand and gravel substrates in riffles and shoals.
Pink mucket (pearlymussel) *Lampsilis abrupta*	Endangered	No	X	X			X		Found in regulated rivers modified by locks and dams. Also occurs in the transitional areas between the lentic and lotic habitats of reservoir and tailwater systems, though does not typically occur in reservoirs.
Purple cat's paw (pearlymussel) *Epioblasma obliquata*	Endangered	No					X		Occurs in shallow waters with swift currents within medium to large rivers in the Ohio River basin. Found in substrates varying from sand to boulders.
Rabbitsfoot *Quadrula cylindrica cylindrica*	Threatened	Yes (Final)	X C	X C			X C		Suitable habitat characterized as small to medium streams and some larger rivers. Suitable bottom substrates include a mixture of sand and gravel.
Rayed bean *Villosa fabalis*	Endangered	No		X	X		X		Generally found in smaller headwater creeks. May also occur in larger rivers and wave-washed areas of glacial lakes. Typically found in gravel or sand substrates in and around the roots of aquatic vegetation.

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
Rough pigtoe *Pleurobema plenum*	Endangered	No		X					Only known to occur within streams in the Ohio River basin. Found in the shallow riffle areas within a variety of substrates including mud and sand, bedrock, and rubble/gravel.
Round hickorynut *Obovaria subrotunda*	Threatened	Yes (Final)		X C	X		X		Typically occurs up to 6.5 feet deep in sand and gravel riffle, run, and pool habitats in streams and rivers. May also be found in sandy mud.
Salamander mussel *Simpsonaias ambigua*	Proposed Endangered	Yes (Proposed)	X	X	X C	X C	X C	X C	Inhabits swift-flowing rivers and streams featuring rocks and crevices that provide areas of shelter.
Scaleshell mussel *Leptodea leptodon*	Endangered	No	X						Occupies stable riffles and runs with gravel or mud substrate in medium to large rivers with low to medium gradients.
Sheepnose mussel *Plethobasus cyphyus*	Endangered	No	X	X		X	X	X	Found in mixtures of coarse sand, gravel, and clay in medium to large stream systems. Generally found in shallow shoal habitats with moderate to swift currents.
Snuffbox mussel *Epioblasma triquetra*	Endangered	No	X	X	X	X	X	X	Occurs in small to medium creeks, large rivers, and lakes. Typically found in riffles, shoals, and wave-washed lake shores in areas of swift current/wave action and substrates including gravel, sand, and sometimes cobble/boulders.
Spectaclecase (mussel) *Cumberlandia monodonta*	Endangered	No	X			X		X	Found in large rivers in areas sheltered from the force of the main current. Often found clustered in firm mud, beneath rock slabs, between boulders, or under tree roots.

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
White catspaw (pearlymussel) *Epioblasma perobliqua*	Endangered	No		X			X		Currently known to exist only in a 3-mile portion of Fish Creek in Ohio, although the species historically occurred in Indiana as well. Occurs in areas of coarse gravel and sand substrate within fast flowing riffles and runs.
Winged mapleleaf *Quadrula fragosa*	Endangered	No				X		X	Found in riffles with clean gravel, sand, or rubble substrates and clear, high-quality water. May also occur in large rivers and streams on mud/mud-covered gravel and gravel bottoms.
Snails									
Iowa Pleistocene snail *Discus macclintocki*	Endangered	No	X					X	Restricted to algific talus slopes, which are developed over the entrances to small fissures and caves. Algific slopes only form under unusual circumstances in areas with significant rock exposure and recent proximity to a large ice sheet.
Insects									
American burying beetle *Nicrophorus americanus*	Threatened	No					X		Habitat generalist occurring in wet meadows, partially forested loess canyons, oak – hickory forests, shrubland and grasslands, pastures, riparian areas, and coniferous and deciduous forests.
Dakota skipper *Hesperia dacotae*	Threatened	Yes (Final)				X C			Occurs in two types of prairies: (1) moist bluestem prairie supporting wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camus (*Zygadenus elegans*); and (2) upland, dry prairie on hillsides and ridges dominated by bluestem grasses, needlegrass (*Stipa* spp.), and floral resources.

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
Hine's emerald dragonfly *Somatochlora hineana*	Endangered	Yes (Final)	X C		X C			X C	Occupies wetlands dominated by grass-like plants and fed by water from a mineral source or fens. Wetlands are typically groundwater fed with shallow water slowly flowing through vegetation.
Hungerford's crawling water beetle *Brychius hungerfordi*	Endangered	No			X				Often found in plunge pools downstream of culverts and natural or human-made impoundments. Generally found in areas with moderate to fast streamflow in seasonal streams fed at least partially by groundwater.
Karner blue butterfly *Lycaeides melissa samuelis*	Endangered	Yes (Proposed)	X	X	X	X	X	X	Dependent on wild lupine (*Lupinus* spp.) plants. Adults mate and lay eggs on wild lupines, and caterpillars feed on the wild lupine leaves. Typically found in grasslands.
Mitchell's satyr butterfly *Neonympha mitchellii mitchellii*	Endangered	No		X	X		X		Restricted to fen wetlands containing low nutrients and receiving carbonate-rich groundwater from seeps and springs. Generally associated with beaver-influenced wetlands, although occasionally occur in semi-open riparian or floodplain forest areas.
Poweshiek skipperling *Oarisma Poweshiek*	Endangered	Yes (Final)			X C			X C	Suitable habitat includes prairie fens, grassy lake and stream margins, moist meadows, sedge meadows, and wet- to dry- native prairie.
Rusty patched bumble bee *Bombus affinis*	Endangered	No	X	X		X	X	X	Occurs in a variety of habitats including prairies, woodlands, marshes, agricultural landscapes, and residential parks and gardens with sufficient nectar and pollen food resources. Queens overwinter in undisturbed ground.

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
Crustaceans									
Illinois cave amphipod *Gammarus acherondytes*	Endangered	No	X						Inhabits shallow waters less than 15.7 inches with gravel or cobble substrates. Requires cold water.
Flowering Plants									
Decurrent false aster *Boltonia decurrens*	Threatened	No	X						Occurs on the shores of lakes and banks of streams including the Illinois River. Most commonly found in lowland areas that are subject to flood disturbances.
Dwarf Lake iris *Iris lacustris*	Threatened	No			X			X	Found within shallow soils over moist calcareous sands, gravel, and beach rubble on the Great Lakes coasts. Requires at least some direct sunlight.
Eastern prairie fringed orchid *Platanthera leucophaea*	Threatened	No	X	X	X		X	X	Can be found within a variety of habitats including wet prairie, mesic prairie, sedge meadow, fen, marsh, and marsh edge. Habitat is typically moist or moderately moist.
Fassett's locoweed *Oxytropis campestris var. chartacea*	Threatened	No				X		X	Grows on gentle, sand-gravel shoreline slopes around shallow lakes fed by groundwater seepage. Suitable habitat areas are typically subject to frequent, large fluctuations in water levels.
Houghton's goldenrod *Solidago houghtonii*	Threatened	No			X				Houghton's goldenrod is primarily found in shallow, trough-like interdunal wetlands that parallel shoreline areas as well as on calcareous beach sands, rocky and cobble shores, beach flats, and edges of marl ponds. Occurs in areas lacking competing vegetation.

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
Lakeside daisy *Hymenoxys herbacea*	Threatened	No	X		X		X		Occurs in alvar habitat, which consists of sparsely vegetated flat limestone or dolostone bedrock with thin to no soil cover. Alvar habitat is also subject to drought.
Leafy prairie-clover *Dalea foliosa*	Endangered	No	X						Requires direct sunlight. Occurs in thin-soiled mesic and wet-mesic dolomite prairie, limestone cedar glades, and limestone barrens lacking competing vegetation. Does not occur in areas of advanced stages of woody succession.
Leedy's roseroot *Rhodiola integrifolia ssp. leedyi*	Threatened	No				X			Found only on cliffsides, although the specific conditions of suitable cliffsides may vary. Primarily occurs on north-facing moderate cliffs.
Mead's milkweed *Asclepias meadii*	Threatened	No	X	X				X	Typically found in grasslands that are adapted for drought and fire, such as upland tallgrass prairies and glad/barren habitats.
Michigan monkey-flower *Mimulus michiganensis*	Endangered	No			X				Occurs in cold calcareous springs, seeps, and streams through northern white-cedar (*Thuja occidentalis*) forests. Also occurs at the base of bluffs near the Great Lakes shoreline.
Minnesota dwarf trout lily *Erythronium propullans*	Endangered	No				X			Occurs on fewer than 600 acres of woodland habitat. Suitable areas are characterized by rich slopes dominated by maple and basswood and in adjacent floodplains dominated by elm and cottonwood.
Northern wild monkshood *Aconitum noveboracense*	Threatened	No					X	X	Generally found on partially or fully shaded cliffs, algific talus slopes, or in cool areas along streams. Suitable habitat is characterized by cool soils and cold air drainage or cold groundwater flowage.

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
Pitcher's thistle *Cirsium pitcher*	Threatened	No	X	X	X			X	Grows on open sand dunes and low open beach ridges along the shores of Lakes Michigan, Superior, and Huron. The species was previously extirpated from Illinois but has since been reintroduced in Lake County.
Prairie bush-clover *Lespedeza leptostachya*	Threatened	No	X			X		X	Found in disturbed tallgrass prairie habitats in a variety of soil conditions including dry, dry-mesic, or bedrock prairies. Suitable habitats are those that have previously been mowed, burned, cultivated, or grazed.
Short's bladderpod *Physaria globosa*	Endangered	Yes (Final)		X C					Thrives in areas with direct sunlight and low levels of shading from midstory and overstory vegetation. Habitat conditions including shallow soils, limited water availability, and frequent disturbances often limit woody vegetation growth and are therefore optimal for this species.
Short's goldenrod *Solidago shortii*	Endangered	No		X					Occurs in open, dry habitats with full sun or partial shade. Suitable habitat typically includes limestone cedar glades, open eroded areas, cedar thickets, pastures, rock ledges along highways, and the edges of dry, open oak-hickory forest.
Small whorled pogonia *Isotria medeoloides*	Threatened	No					X		Occurs in older hardwood stands of beech, oak, maple, birch (*Betula* spp.), and hickory featuring an open understory. May also grow in stands of softwoods such as hemlock (*Tsuga* spp.). Typically grows in acidic soils near small streams with a thick layer of dead leaves.

Species Name	Federal Status	Critical Habitat	Potential to Occur and Designated Critical Habitat in State						Preferred Habitat
			IL	IN	MI	MN	OH	WI	
Virginia sneezeweed *Helenium virginicum*	Threatened	No		X					Generally, occurs in seasonally flooded sinkhole ponds. May also occur in disturbed sites including wet meadows, depressions in lawns, roadside ditches, and along the edges of farm ponds.
Virginia spiraea *Spiraea virginiana*	Threatened	No					X		Typically found in disturbed (frequently scoured) areas in the early stages of succession along the banks of rivers.
Western prairie fringed orchid *Platanthera praeclara*	Threatened	No				X			Found in moist tallgrass prairies and sedge meadows. Typically associated with sedges, reedgrass, and rushes.
Ferns and Allies									
American Hart's-tongue fern *Asplenium scolopendrium var. Americanum*	Threatened	No			X				Found in areas with approximately 25 to 75 percent herbaceous cover. Requires winter snow cover.

Sources (unless otherwise indicated): USFWS 2024d, 2024e, 2024f.

Key: C= Critical Habitat has been designated in state, IL = Illinois, IN = Indiana, MI = Michigan, MN = Minnesota, OH = Ohio, WI = Wisconsin, X = Species has potential to occur in state.

[1]Species only needs to be considered in this state if any of the following conditions apply: (1) only actions that occur in large wetland complexes during the red knot migratory window (May 1 to September 30); or (2) only actions that occur along coastal areas during the red knot migratory window (May 1 to September 30).

[2]Species only needs to be considered in this state if any of the following conditions apply: (1) project is within Tier 1 habitat; (2) project is within Tier 2 habitat; or (3) project is within eastern massasauga range.

Appendix D – Environmental Protection Agency's Notice of Intent Response

REGION 5
CHICAGO, IL 60604

July 29, 2024

VIA ELECTRONIC MAIL ONLY

Duane Castaldi
Federal Emergency Management Agency
536 South Clark Street
Chicago, Illinois 60605

Re: EPA Scoping Comments: Flood Control Projects for Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin

Dear Mr. Castaldi:

The U.S. Environmental Protection Agency (EPA) has reviewed the Federal Emergency Management Agency's (FEMA) June 27, 2024, Notice of Intent (NOI) to prepare a Programmatic Environmental Assessment (PEA) for the project referenced above. This letter provides EPA's comments, pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

The NOI explains that flooding is occurring with greater frequency and intensity. This coupled with a rise in storm frequency and intensity from climate change, is resulting in increased inundation of communities and infrastructure, including critical facilities, within Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. The PEA will evaluate flood control measures eligible for FEMA grant funding. The project purpose is to reduce frequency of flooding and associated loss and damage.

The proposed flood control projects may include levees along streams, channels, and other waterway banks, and floodwalls and levees around facilities and structures. The projects may take place where current flood levees have been damaged, in areas where no damage has occurred, but improvements would mitigate future flood damage, or in areas where there are currently no levees. Project implementation may affect wetlands, communities with environmental justice concerns, historic, cultural, and archaeological resources, and threatened and endangered species, among other environmental effects categories.

To assist FEMA in meeting the project purpose in a manner that best protects human health and the environment, EPA offers the enclosed: (1) Detailed Scoping Comments and (2) Construction Emission Control Checklist.

Thank you for the opportunity to provide input at the earliest stages of project development. Please send an electronic copy of future NEPA documents to R5NEPA@epa.gov. If you have questions or would like to discuss the contents of this letter further, please contact the lead NEPA reviewer, Julie Car, at car.julie@epa.gov or 312-353-1369.

Sincerely,

KRYSTLE MCCLAIN

Digitally signed by KRYSTLE MCCLAIN
Date: 2024.07.29 09:57:06 -05'00'

Krystle Z. McClain, P.E.
NEPA Program Supervisor
Environmental Justice, Community Health, and Environmental Review Division

ENCLOSURES
EPA's Detailed Scoping Comments
Construction Emission Control Checklist

cc (with enclosures):
Chad Konickson, USACE-St. Paul District (chad.konickson@usace.army.mil)
Keith McMullen, USACE-St. Louis District (keith.a.mcmullen@usace.army.mil)
Julie Rimbault, USACE-Rock Island District (julie.c.rimbault@usace.army.mil)
Teralyn Pompeii, USACE-Chicago District (teralyn.r.pompeii@usace.army.mil)
Charlie Simon, USACE-Detroit District (Charles.m.simon@usace.army.mil)
Laban Lindley, USACE-Louisville District (laban.c.lindley@usace.army.mil)
Steve Metivier, USACE-Buffalo District (steven.v.metivier@usace.army.mil)
Michael Hatten, USACE-Huntington District (Michael.e.hatten@usace.army.mil)
Shauna Marquardt, USFWS-Twin Cities ESFO (shauna_marquardt@fws.gov)
Kraig McPeek, USFWS-Illinois/Iowa ESFO (kraig_mcpeek@fws.gov)
Susan Cooper, USFWS-Indiana ESFO (susan_e_cooper@fws.gov)
Scott Hicks, USFWS-Michigan ESFO (scott_hicks@fws.gov)
Erin Knoll, USFWS-Ohio ESFO (erin_knoll@fws.gov)
Lainet Garcia-Rivera, USFWS-Minnesota-Wisconsin ESFO (lainet_garcia-rivera@fws.gov)

EPA's Detailed Scoping Comments
FEMA Flood Control Projects for Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin

July 29, 2024

1. NEPA PROCESSES, PROJECT DEVELOPMENT, AND AFFECTED ENVIRONMENTS

A. EPA understands that FEMA is developing a Programmatic EA (PEA), which will take a broad look at potential flood control projects that can reduce flooding across six midwestern states. With the limited information provided, it is unclear which decisions FEMA plans to make based on the PEA process and which decisions would be made in subsequent project-specific plans and work. As a result, some of EPA's scoping comments may be more relevant to future stages of this project.

Recommendations for the Draft PEA:

1. Describe the scope of decisions that FEMA will make through this programmatic NEPA process, and separately list which decisions FEMA will make through future project-level NEPA processes.
2. Include a Purpose and Need statement that meets the requirements of the Council on Environmental Quality Regulations for Implementing NEPA (40 CFR § 1501.5).
3. Evaluate all reasonable alternatives, in line with CEQ NEPA Regulations (40 CFR § 1501.5).
4. Describe resources and communities that may be affected by the proposed undertaking. Include photos, figures, and maps.
5. For each specific modification action and alternative, describe actions that would be taken, activities that would occur in-water vs. out of the water, and materials that may be used.
6. To the extent possible at this stage in the NEPA process, visually depict project alternatives. Consider staging areas and access roads, among other features.

2. COORDINATION RELATED TO OTHER RESTORATION PROJECTS AND INITIATIVES

A. Restoration plans, projects, and funding initiatives, some of which EPA and FEMA collaborate on, are currently underway to restore and protect the Great Lakes. It is important for the PEA to explain how a proposed project could or will align with such efforts, especially the Great Lakes Restoration Initiative (GLRI). Federal agencies use GLRI resources to strategically target the biggest threats to the Great Lakes ecosystem and to accelerate progress toward long-term goals.[1] The PEA may also consider alignment with Lakewide Action and Management Plans[2] (LAMPs), which are

[1] https://www.glri.us/

[2] Great Lakes LAMPs are available at: https://www.epa.gov/greatlakes/lakewide-action-and-management-plans-great-lakes

ecosystem-based management strategies for protecting the restoring Great lakes water quality.

Recommendations for the Draft PEA:

1. Evaluate how the programmatic decisions made through this PEA process would support:
    a. The objectives, commitments, and measures of the Great Lakes Restoration Initiative Action Plan III[3] and the Draft GLRI Action Plan IV,[4]
    b. The goals, objectives, priority projects and action of the Lake Erie, Lake Huron, Lake Michigan, Lake Ontario, and Lake Superior LAMPs, and
    c. The individual water quality goals and commitments of each individual state.

3. AIR QUALITY

A. The proposed project would result in emissions from construction equipment. Temporary construction emissions have the potential to affect human health, especially in sensitive populations, such as the elderly, children, and those with impaired respiratory systems.

Recommendations for the Draft PEA:

1. Discuss the current air quality for the project areas. Indicate whether the project areas are in non-attainment status for any National Ambient Air Quality Standards (NAAQS) and the implications for implementing projects in non-attainment or maintenance status for NAAQS.
2. Discuss potential emissions expected from implementation of the proposed projects. Consider equipment used for construction as well as truck trips to haul materials.
3. Identify and commit to specific measures to reduce construction emissions. Options include: (1) requiring dust suppressant strategies, such as watering soils, (2) limiting and enforcing idle time for construction trucks and heavy equipment, and (3) soliciting bids that require zero-emission technologies or advanced emission control systems. Additional best practices are identified in the enclosed Construction Emission Control Checklist.
4. Create a construction traffic management plan that ensures trucks hauling materials and heavy machinery avoid areas where children congregate within adjacent neighborhoods, when possible. Route construction truck traffic away from schools, daycare facilities, and parks, if applicable, and use crossing guards when such areas cannot be avoided. In addition to air quality

[3] Covering Fiscal Years 2020-2024 – See https://www.epa.gov/sites/default/files/2019-10/documents/glri-action-plan-3-201910-30pp.pdf

[4] Covering Fiscal Years 2025-2029 – See https://glri.us/sites/default/files/glri_apiv_draft_for_public_input_april_11_2024.pdf

benefits, careful routing may protect children from vehicle-pedestrian accidents.

4. TRIBAL RESOURCES

Executive Order 13175: *Consultation and Coordination with Indian Tribal Governments* directs Federal agencies to "*have an accountable process to ensure meaningful and timely input by Tribal officials in the development of regulatory policies that have Tribal implications*." EPA is committed to enhancing interagency coordination and collaboration to protect Tribal treaty and reserved rights.[5] Tribal treaty rights are exercised across the Great Lakes states.

While Tribal nations ceded land to the U.S. Government for settlement, they still hold judicially affirmed reserved rights to hunt, fish, and gather in ceded lands. Tribal reserved rights can be exercised on public lands and those private lands upon which public hunting, fishing, and gathering is permitted. FEMA's projects may be proposed on lands with reserved rights.

A. *Included Tribes and Scope of Impacts Considered*

FEMA should ensure early and thorough government-to-government engagement with the Federally recognized Tribes that may be impacted by proposed projects. EPA recommends that FEMA review the Best Practices for Identifying and Protecting Tribal Treaty Rights, Reserved Rights, and Other Similar Rights in Federal Regulatory Actions and Federal Decision-Making[6] document to enhance efforts to integrate consideration of Tribal treaty and reserved rights early into agency decision-making and regulatory processes, and to strengthen consultation policies.

Recommendations for the Draft PEA:

1. Include a complete list of the federally recognized Tribes that may be impacted by FEMA's individual projects, and specifically discuss the reserved rights of signatories of the corresponding Treaties (and court cases) in the context of the proposed projects.
2. Explain FEMA's process for identifying federally recognized Tribes that may have historic or cultural resources present in project areas, as Tribes with ancestral ties to project areas may reside elsewhere. To identify additional Tribal groups that may have ties to project areas, consider using the U.S. Housing and Urban Development's Tribal Assessment Directory Tool[7] for screening, while also using other sources of information.

---

[5] EPA, among many other agencies, is a signatory to the December *2021 Memorandum of Understanding Regarding Interagency Coordination and Collaboration for the Protection of Tribal Treaty Rights and Reserved Rights (MOU)*. See: https://www.epa.gov/tribal/memorandum-understanding-regarding-interagency-coordination-and-collaboration-protection

[6] This report was authored by the Treaty and Reserved Rights Working Group, formed in 2021 on behalf of the 17 Federal agencies that signed the MOU referenced in Footnote 5.

[7] The Tribal Assessment Directory Tool is available at: https://egis.hud.gov/TDAT/

3. Identify and analyze long-term impacts to treaty resources and Tribal economies from implementation of proposed projects. Significant numbers of Tribal members currently depend on treaty resources for food, medicine, and livelihood.
4. Explain potential impacts to the customs and practices of members of Tribes within proposed project locations.
5. In the cumulative impacts analysis of treaty reserved rights, assess project impacts in the context of historic losses to public lands and waters in the project area where Tribes may exercise treaty reserved rights, including accounting for, and minimizing, the further fragmentation of lands and resources.
6. Provide additional expanded information on Tribal consultation undertaken, specifically to clarify (1) proposed Tribal coordination and/or the results of Tribal coordination (by Tribe), (2) how verbal and written Tribal input will affect project design, protective measures to be implemented, or other project decisions, and (3) FEMA's plans for future Tribal engagement should individual projects progress.

B. ***Access to Treaty Resources***

In addition to potential direct and permanent impacts to treaty resources resulting from project implementation, there is a possibility for both temporary and permanent impacts to Tribal members' access to lands and waters to exercise Tribal treaty and reserved rights.

Recommendations for the Draft PEA:

1. Describe the implications and impacts to Tribal treaty and reserved rights that could result from increased use of areas near project implementation. Specifically, clarify if increased recreational activity resulting from project implementation could alter the ability of Tribal members to exercise their reserved rights.
2. Describe disruptions to the exercise of Tribal treaty and reserved rights that could come from maintenance of implemented projects. Consider commitments to coordinate maintenance activities with Tribes to minimize disruption to cultural events and gatherings.
3. Consider the ways in which Tribal individuals access public lands to exercise treaty reserved rights and assess the potential for impacts to their access should Tribal members not access the lands via motorized vehicles. Should there be impacts to access, work to ensure Tribal members have continued access methods to public lands.
4. Consider cumulative losses of culturally important plants within the project footprints alongside other threats to those plants, including the effects of climate change, potential threats due to invasive species, etc.

5. Determine, and specify, whether the loss of culturally important plants in the project footprints will be permanent or if those species will return (or be restored) following completion of construction activities.

5. AQUATIC RESOURCE EFFECTS

A. It is important for the PEA to consider potential effects to aquatic resources, disclose such effects to the public, and identify plans for avoidance, minimization, and mitigation measures (as required). Fill below the Ordinary High Water Mark of Waters of the U.S., or fill into regulated adjacent wetlands, may trigger Clean Water Act (CWA) Section 404 permitting and the need for CWA Section 401 water quality certification from state or tribal governments.

Recommendations for the Draft PEA:

1. Commit to undertaking wetland delineations for all project locations, including a commitment to investigate all staging locations and access road areas for the presence of regulated water resources.
2. Analyze and disclose potential permanent, temporary, direct, indirect, and cumulative effects to aquatic resources at a programmatic level.
3. Discuss how activities under the PEA would fulfill the requirements of the CWA Section 404(b)(1) Guidelines, including alternatives and mitigation sequencing requirements (first avoid, then minimize, and finally compensate for those effects that cannot be avoided or minimized).
4. Discuss how proposed projects will be coordinated with state and federal resource agencies that regulate Waters of the U.S. or Waters of the State. Commit to coordination with all regulatory agencies.
5. Make programmatic-level commitments for best practices to protect water quality and in-stream aquatic habitats during future project implementation.

6. COASTAL ZONE MANAGEMENT ACT

A. FEMA's individual projects may be located within the boundaries of the Lake Erie, Lake Michigan, and Lake Superior Coastal Programs and could require a Federal Consistency Determination under the Coastal Zone Management Act.

Recommendations for the Draft PEA: Provide information on the status of coordination with state agencies regarding the request for a Federal Consistency Determination.

7. PROJECT DESIGN / PROJECT STAGING

A. As the studies of alternatives progresses and advances, ensure that the PEA considers the following:

Recommendations for the Draft PEA:

1. Consider effects on existing infrastructure (e.g., drinking water intake locations, sewer/septic locations, utilities, and stormwater and effluent

discharge point sources) and how project implementation and construction would affect this infrastructure.

2. Provide information on coordination with the Federal, state, and local agencies regarding required permitting and any required mitigation for proposed work under the scope of activities identified.
3. Provide a rationale to support selection of the storm design-year that would be used for individual projects.
4. Consider resiliency and adaptation measures or plans to promote high performance of project elements under changing temperature and precipitation conditions. Describe how such information is being incorporated into the projects. Use EPA's Climate Change Adaptation Resource Center[8] to view case studies and identify appropriate mitigation strategies.

8. CONTAMINATION

A. Unknown contamination could potentially be discovered during future, project-specific earthmoving activities.

Recommendations for the Draft PEA:

1. Discuss potential environmental effects associated with contaminated waters and soils that could be encountered during project implementation.
2. Identify programmatic-level screening and preparedness measures that would be applied to all flood control measures associated with proposed projects.
3. Consider general procedures for contractors to safely identify, manage, and dispose of contamination, if any should be found.

9. CLIMATE CHANGE AND GREENHOUSE GASES

A. Executive Order 14008: Tackling the Climate Crisis at Home and Abroad states, "*The United States and the world face a profound climate crisis. We have a narrow moment to pursue action…to avoid the most catastrophic impacts of that crisis and to seize the opportunity that tackling climate change presents*." The U.S. Global Change Research Program's National Climate Assessment provides data and scenarios that may be helpful in assessing trends in temperature, precipitation, and frequency and severity of storm events.[9]

Any action alternative would directly release greenhouse gas (GHG) emissions during construction from trucks hauling materials, workers' vehicles, and operation of construction equipment. It is important for the Draft PEA to fully quantify and adequately disclose the effects of GHG emissions from the No Action alternative and all

[8] EPA's Climate Change Adaptation Resource Center is available at https://www.epa.gov/arc-x

[9] Information regarding changing climate conditions is available through the National Climate Assessment at https://nca2023.globalchange.gov/

action alternatives and discuss the implications of those emissions in light of science-based policies established to avoid the worsening effects of climate change.

Federal courts have consistently held that NEPA requires agencies to disclose and consider climate effects in their reviews, including effects from GHG emissions. On January 9, 2023, the Council on Environmental Quality (CEQ) published interim guidance to assist Federal agencies in assessing and disclosing climate change effects during environmental reviews.[10] CEQ developed this interim guidance in response to Executive Order 13990: Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. This interim guidance was effective immediately. CEQ indicated that agencies should use this interim guidance to inform the NEPA review for all new proposed actions. EPA recommends that FEMA apply the interim guidance as appropriate, to ensure robust consideration of potential climate effects, mitigation, and adaptation issues.

In addition, estimates of the social cost of greenhouse gases (SC-GHG)[11] are informative for assessing the effects of GHG emissions. SC-GHG estimates allow analysts to monetize the societal value of changes in GHG emission from actions that have small, or marginal, effects on cumulative global emissions. Estimates of the social cost of carbon ($SC\text{-}CO_2$) and other GHGs (e.g., social cost of methane ($SC\text{-}CH_4$)) have been used for over a decade in Federal government analyses. Quantification of anticipated GHG releases and associated SC-GHG comparisons among all alternatives (including the No Action alternative) would inform project decision-making and provide clear support for implementing all practicable measures to minimize GHG emissions and releases.

EPA recommends that FEMA review EPA's final technical report, "*Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances*,"[12] which explains the methodology underlying the most recent set of SC-GHG estimates. To better assist lead Federal agencies with the utilization of these updated estimates, EPA has also recently released a Microsoft Excel "*Workbook for Applying SC-GHG Estimates v.1.0.1*" spreadsheet[13] which was designed by EPA's National Center for Environmental Economics to help analysts calculate the monetized net social costs of increases in GHG emissions using the estimates of the SC-GHGs.

> **Recommendations for the Draft PEA:** FEMA should apply the interim guidance as appropriate, to ensure robust consideration of potential climate effects, mitigation, and adaptation issues. Additional recommendations are as follows:

[10] https://www.federalregister.gov/documents/2023/01/09/2023-00158/national-environmental-policy-act-guidance-on-consideration-of-greenhouse-gas-emissions-and-climate

[11] EPA uses the general term, "social cost of greenhouse gases" (SC-GHG), where possible because analysis of GHGs other than CO_2 are also relevant when assessing the climate damages resulting from GHG emissions. The social cost of carbon ($SC\text{-}CO_2$), social cost of methane ($SC\text{-}CH_4$), and social cost of nitrous oxide ($SC\text{-}N_2O$) can collectively be referenced as the SC-GHG.

[12] https://www.epa.gov/system/files/documents/2023-12/epa_scghg_2023_report_final.pdf

[13] https://www.epa.gov/environmental-economics/scghg

1. ***Emissions & SC-GHG Disclosure and Analysis***
    a) Commit to quantifying estimates of all direct and indirect GHG emissions[14] from each proposed project over its anticipated lifetime for all alternatives, including the No Action alternative, broken out by GHG type.
    b) Use SC-GHG estimates to disclose and consider the climate damages from net changes in direct and indirect emissions of CO_2 and other GHGs resulting from the proposed projects. To do so, EPA recommends a breakdown of estimated net GHG emission changes by individual gas, rather than relying on CO_2-equivalent (CO_2e) estimates, and then monetize the climate effects associated with each GHG using the corresponding social cost estimate (i.e., monetize CH_4 emissions changes expected to occur with the social cost of methane (SC-CH_4) estimate for emissions).[15] When applying SC-GHG estimates, just as with tools to quantify emissions, FEMA should disclose the assumptions (e.g., discount rates) and uncertainties associated with such analysis and the need for updates over time to reflect evolving science and economics of climate effects.
    c) Use comparisons of GHG emissions and SC-GHG across alternatives to inform project decision-making.
    d) Avoid expressing the overall project-level GHG emissions as a percentage of the state or national GHG emissions. The U.S. must reduce GHG emissions from a multitude of sources, each making relatively small individual contributions to overall GHG emissions, in order to meet national climate targets.

2. ***Consistency with Climate Policy***
    a) Include a detailed discussion of the proposed projects' GHG emissions in the context of national and international GHG emissions reduction goals, including the U.S. 2030 Paris GHG reduction target and 2050 net-zero policy.
    b) Provide an analysis of GHG emissions in the context of state policies and

[14] As discussed in Section IV(A) of CEQ's 2023 interim guidance, "agencies generally should quantify all reasonably foreseeable emissions associated with a proposed action and reasonable alternatives (as well as the No Action alternative). Quantification should include the reasonably foreseeable direct and indirect GHG emissions, the agency should use the best available information."

[15] Transforming gases into CO_2e using Global Warming Potential (GWP) metrics, and then multiplying the CO_2e tons by the SC-CO_2, is not as accurate as a direct calculation of the social costs of non-CO_2 GHGs. This is because GHGs differ not just in their potential to absorb infrared radiation over a given time frame, but also in the temporal pathway of their effect on radiative forcing and in their effects on physical endpoints other than temperature change, both of which are relevant for estimating their social cost but not reflected in the GWP. See the Interagency Working Group on Social Cost of Greenhouse Gases' February 2021 Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 for more discussion and the range of annual SC-CO_2, SC-CH_4, and SC-N_2O estimates currently used in Federal benefit-costs analyses.

GHG emissions reduction goals. This analysis should inform and improve FEMA's consideration of mitigation measures.

c) Discuss the implications of the expected increase in GHGs should future proposed projects be implemented. Additionally, discuss the ramifications of making it more difficult to meet state emissions goals due to the increase in GHGs.

d) Discuss how the Inflation Reduction Act (IRA) may affect energy consumption patterns and GHG emissions. The IRA is expected to reduce dependence on fossil fuels while increasing availability for renewable energy sources. The Department of Energy has estimated the effects of the IRA on clean energy and GHG emissions.[16] That report, and its appendix, contain several resources on future energy consumption patterns and forecasts.[17]

e) Include a complete discussion of the extent to which the estimated GHG emissions from the proposed projects and alternatives may be inconsistent with the need to take actions necessary to achieve science-based GHG reduction targets.[18]

3. ***Resilience and Adaptation***

a) Identify practices to reduce and mitigate GHG emissions; include commitments by FEMA to do so in the Draft PEA. We recommend FEMA consider practices in the enclosed Construction Emission Control Checklist.

b) Analyze best available control strategies, while considering sensitive environmental and health receptors (e.g., schools and play areas along truck travel routes).

10. ENVIRONMENTAL JUSTICE

A. Outreach and meaningful engagement are underlying pillars of environmental justice. It is imperative that FEMA determine if construction, operation, and maintenance of the proposed projects (or alternatives) will affect communities with environmental justice concerns. Executive Order (EO) 12898: *Federal Actions to Address Environmental justice in Minority Populations and Low-Income Populations* was supplemented by Executive Order 14096: *Revitalizing Our Nation's Commitment to Environmental Justice for All*. EO 14096 directs Federal agencies, as appropriate and consistent with applicable law, to identify, analyze, and address disproportionate and adverse human health and environmental effects (including risks) and hazards of Federal activities, including those related to climate change and cumulative effects of environmental and other burdens on communities with environmental justice concerns.

[16] https://www.energy.gov/sites/default/files/2022-08/8.18%20InflationReductionAct_Factsheet_Final.pdf
[17] Appendix and resources can be found at: https://www.energy.gov/policy/methodological-appendix
[18] See, e.g., Executive Order 14008; U.S. Nationally Determined Contribution to the Paris Agreement (April 20, 2021).

Under EO 14096, environmental justice is now evaluated based simply on disproportionate and adverse effects. The Fact Sheet accompanying EO 14096[19] states, "*The Executive Order [EO 14096] uses the term 'disproportionate and adverse' as a simpler, modernized version of the phrase 'disproportionately high and adverse' used in Executive Order 12898. Those phrases have the same meaning but removing the word "high" eliminates potential misunderstanding that agencies should only be considering large disproportionate effects*."

EPA's recommendations below suggest opportunities to further analyze, disclose, and reduce such effects.

Recommendations for the Draft PEA:

1. Ensure that references to environmental justice evaluations refer to the current language used in EO 14096 (i.e., disproportionate and adverse).
2. Identify the presence of communities with environmental justice concerns within the project area and within the broader area that could experience environmental effects from the proposed project. Disclose demographic information and summarize input from community members.
3. Describe past activities and future plans to engage communities with environmental justice concerns and Tribes, if applicable, during the environmental review and planning phase, and, if the project commences, during construction and operations.
4. Evaluate the effects of the proposed project on communities with environmental justice concerns and sensitive receptors (e.g., children, people with asthma, etc.).
5. Include an analysis and conclusion regarding whether the proposed actions or any action alternatives may have disproportionate and adverse effects on communities with environmental justice concerns, as specified in CEQ's *Environmental Justice Guidance*.[20]
6. Compare project effects on communities with environmental justice concerns with an appropriate reference community to determine whether there may be disproportionate effects. Consider risk of exposure to hazardous/toxic materials associated with the proposed construction and operation and air quality and noise effects due to construction.
7. Consider any disproportionate non-project-related pollution exposures that communities of concern may already be experiencing, as well as any disproportionate non-pollution stressors that may make the communities susceptible to pollution, such as health conditions, other social determinants of health, and disproportionate vulnerability related to climate change.

[19] FACT SHEET: President Biden Signs Executive Order to Revitalize Our Nation's Commitment to Environmental Justice for All. See https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/21/fact-sheet-president-biden-signs-executive-order-to-revitalize-our-nations-commitment-to-environmental-justice-for-all/

[20] CEQ's Environmental Justice Guidance Under the National Environmental Policy Act. See Section III, Part C-4, https://www.epa.gov/sites/default/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf

8. Identify measures to ensure meaningful community engagement, minimize adverse community effects, and avoid disproportionate effects to communities with environmental justice concerns.
9. Use census-tract-level information to initially help locate communities with environmental justice concerns. For initial screening, use EPA's EJSCREEN[21] mapping tool.
10. In conducting the environmental justice analysis, utilize resources such as the Promising Practices Report[22] and the Community Guide to Environmental Justice and NEPA Methods[23] to appropriately engage in meaningful, targeted, community outreach, analyze effects, and advance environmental justice principles through NEPA implementation.
11. Consider cumulative environmental effects to communities with environmental justice concerns, Tribes, and indigenous peoples in the project area within the environmental justice analysis and disclose conclusions on those effects.
12. Provide an analysis and findings as to whether the proposed projects and all alternatives, including the No Action alternative, would likely have disproportionate and adverse effects on communities with environmental justice concerns or Tribes. Identify what those effects may be and include measures that will be taken to avoid, minimize, or mitigate effects.
13. Establish material hauling routes away from places where children live, learn, and play, to the extent feasible. Consider homes, schools, daycares, and playgrounds. Careful routing may protect children from vehicle-pedestrian accidents. Identify potential material hauling routes in the Draft PEA.

11. NATIONAL HISTORIC PRESERVATION ACT AND TRIBAL CULTURAL RESOURCES

A. The National Historic Preservation Act (NHPA) and NEPA are independent statutes, yet may be executed concurrently to optimize efficiencies, transparency, and accountability to better understand the effects to the human, natural, and cultural environment.

Recommendations for the Draft PEA:

1. Investigate the potential for development of a programmatic agreement (PA) with the individual State Historic Preservation Officers (SHPOs) to complete NHPA Section 106 consultation on a project-by-project basis during the design phase for each individual project in a state.
2. Describe FEMA's approach to fulfilling NHPA Section 106 requirements for individual projects;
3. Document coordination and input received from the SHPOs and Tribal Historic Preservation Officers (THPOs) thus far and explain how FEMA has and will continue to address input provided by the SHPOs and THPOs;
4. Assess options for documenting historic building or structure information

[21] http://www.epa.gov/ejscreen
[22] https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf
[23] https://www.energy.gov/sites/prod/files/2019/05/f63/NEPA%20Community%20Guide%202019.pdf

prior to demolition, should removal or demolition be necessary;
5. Discuss the status of developing one or more PAs for this project; and
6. Describe the process for (1) addressing inadvertent discoveries (e.g., Tribal remains, artifacts, other culturally or historically sensitive items) and (2) complying with the Native American Graves Protection and Repatriation Act.

12. <u>THREATENED AND ENDANGERED SPECIES AND TERRESTRIAL RESOURCES</u>

A. Section 7 of the Endangered Species Act (ESA) directs all Federal agencies to ensure that any action they authorize, fund, or carry-out does not jeopardize the continued existence of a threatened or endangered species or to proposed or designated Critical Habitat for an identified species. Flood control projects could introduce non-native invasive species and could degrade aquatic habitats if not implemented correctly. Additionally, consideration should be taken to determine if potential project locations are important migratory bird stopover locations, which are critical for migratory birds to rest, eat, and shelter each spring and fall.

<u>Recommendations for the Draft PEA:</u>

1. Use the U.S. Fish and Wildlife Service (USFWS) project planning tool, known as IPAC – Information for Planning and Conservation, to obtain a list of resources in the project areas.
2. Determine whether the proposed actions may affect protected resources.[24] If resources may be affected, engage in consultation with the USFWS. Document coordination and formal consultation in the PEA, with the goal of aligning NEPA and the ESA Section 7 consultation processes.
3. Determine whether any state-listed species could be affected by the proposed projects and document any coordination with the appropriate state agency.
4. Discuss potential effects to wildlife resources from all proposed alternatives and whether any seasonal work restrictions will be required.
5. Describe how the projects would meet the requirements of Executive Order 13112: *Invasive Species*.
6. Consider program-wide protective measures, such as requiring all construction contractors to wash equipment prior to contact with waters and unpaved areas to reduce the likelihood of spreading invasive species.
7. Commit to revegetating all disturbed green spaces, including staging areas, after the project is complete. Use native species and pollinator friendly plants wherever feasible.
8. Commit to planting trees to offset tree loss at a ratio of 1:1 or greater.

[24] The USFWS is responsible for the conservation of wildlife resources, including endangered and threatened species, migratory birds, certain marine mammals, certain native and interjurisdictional fish, and other species of concern.

13. PUBLIC OUTREACH AND PLAIN LANGUAGE

A. The proposed projects may be highly visible to the public.

Recommendations for the Draft PEA:

1. Discuss how FEMA plans to keep surrounding communities informed of project schedules, plans, and protective measures that construction contractors will be required to follow.
2. Consider creating a list of required construction mitigation measures and how FEMA will ensure that information is easily accessible to the public. Include a phone number for residents to call if contractors do not follow protective measures, such as idling time limits.
3. Ensure the PEA is written in plain language with the ability to be understood by a reader not familiar with project locations, area history, related/previous projects in the vicinity, or a background in ecology, engineering, or water resources. Technical terms (e.g., floodplain mapping terms) should be explained in plain language.

14. OTHER COMMENTS

A. FEMA should plan to respond to substantive comments received on the scoping request from the public and all comments from other state and Federal agencies and Tribes.

Recommendations for the Draft PEA:

1. Create an appendix to include all comments received during the scoping comment period, including any applicable transcripts of comments from the public, and copies of all comment letters received.
2. For all government agency letters received, include FEMA's responses to specific comments from each letter.

B. FEMA can access the following resources to obtain environmental information related to the project area.

Recommendations for the Draft PEA:

- WATERS (Watershed Assessment, Tracking, & Environmental Results System):[25] https://www.epa.gov/waterdata/waters-watershed-assessment-tracking-environmental-results-system
- Envirofacts: https://www3.epa.gov/enviro/facts/multisystem.html
- EJSCREEN: https://www.epa.gov/ejscreen
- NEPAssist: https://www.epa.gov/nepa/nepassist
- CWA 303(d) Listed Impaired Waters: https://mywaterway.epa.gov/
- National Ambient Air Quality Standards status: https://www.epa.gov/green-book

[25] The Watershed Assessment, Tracking, & Environmental Results System (WATERS) unites water quality information previously available only from several independent and unconnected databases.

U.S. Environmental Protection Agency
Construction Emission Control Checklist

Diesel emissions and fugitive dust from project construction may pose environmental and human health risks and should be minimized. In 2002, EPA classified diesel emissions as a likely human carcinogen, and in 2012 the International Agency for Research on Cancer concluded that diesel exhaust is carcinogenic to humans. Acute exposures can lead to other health problems, such as eye and nose irritation, headaches, nausea, asthma, and other respiratory system issues. Longer term exposure may worsen heart and lung disease.[1] We recommend FEMA consider the following protective measures and commit to applicable measures in the Draft PEA.

Mobile and Stationary Source Diesel Controls

Purchase or solicit bids that require the use of vehicles that are equipped with zero-emission technologies or the most advanced emission control systems available. Commit to the best available emissions control technologies for project equipment in order to meet the following standards.

- On-Highway Vehicles: On-highway vehicles should meet, or exceed, the EPA exhaust emissions standards for model year 2010 and newer heavy-duty, on-highway compression-ignition engines (e.g., long-haul trucks, refuse haulers, shuttle buses, etc.).[2]
- Non-road Vehicles and Equipment: Non-road vehicles and equipment should meet, or exceed, the EPA Tier 4 exhaust emissions standards for heavy-duty, non-road compression-ignition engines (e.g., construction equipment, non-road trucks, etc.).[3]
- Locomotives: Locomotives servicing infrastructure sites should meet, or exceed, the EPA Tier 4 exhaust emissions standards for line-haul and switch locomotive engines where possible.[4]
- Marine Vessels: Marine vessels hauling materials for infrastructure projects should meet, or exceed, the latest EPA exhaust emissions standards for marine compression-ignition engines (e.g., Tier 4 for Category 1 & 2 vessels, and Tier 3 for Category 3 vessels).[5]
- Low Emission Equipment Exemptions: The equipment specifications outlined above should be met unless: 1) a piece of specialized equipment is not available for purchase or lease within the United States; or 2) the relevant project contractor has been awarded funds to retrofit existing equipment, or purchase/lease new equipment, but the funds are not yet available.

Consider requiring the following best practices through the construction contracting or oversight process:

- Establish and enforce a clear anti-idling policy for the construction site.
- Use onsite renewable electricity generation and/or grid-based electricity rather than diesel-powered generators or other equipment.
- Use electric starting aids such as block heaters with older vehicles to warm the engine.
- Regularly maintain diesel engines to keep exhaust emissions low. Follow the manufacturer's recommended maintenance schedule and procedures. Smoke color can signal the need for maintenance (e.g., blue/black smoke indicates that an engine requires servicing or tuning).
- Where possible, retrofit older-tier or Tier 0 nonroad engines with an exhaust filtration device before it enters the construction site to capture diesel particulate matter.
- Replace the engines of older vehicles and/or equipment with diesel- or alternatively-fueled engines

[1] https://kclpure.kcl.ac.uk/portal/files/6492297/coverBenbrahim_Tallaa_2012_Lancet_Oncology.pdf
[2] https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-heavy-duty-highway-engines-and-vehicles
[3] https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-nonroad-engines-and-vehicles
[4] https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-nonroad-engines-and-vehicles
[5] https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-nonroad-engines-and-vehicles

certified to meet newer, more stringent emissions standards (e.g., plug-in hybrid-electric vehicles, battery-electric vehicles, fuel cell electric vehicles, advanced technology locomotives, etc.), or with zero emissions electric systems. Retire older vehicles, given the significant contribution of vehicle emissions to the poor air quality conditions. Implement programs to encourage the voluntary removal from use and the marketplace of pre-2010 model year on-highway vehicles (e.g., scrappage rebates) and replace them with newer vehicles that meet or exceed the latest EPA exhaust emissions standards, or with zero emissions electric vehicles and/or equipment.

Fugitive Dust Source Controls

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative, where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
- Install wind fencing and phase grading operations where appropriate and operate water trucks for stabilization of surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

Occupational Health

- Reduce exposure through work practices and training, such as maintaining filtration devices and training diesel-equipment operators to perform routine inspections.
- Position the exhaust pipe so that diesel fumes are directed away from the operator and nearby workers, reducing the fume concentration to which personnel are exposed.
- Use enclosed, climate-controlled cabs pressurized and equipped with high-efficiency particulate air (HEPA) filters to reduce the operators' exposure to diesel fumes. Pressurization ensures that air moves from inside to outside. HEPA filters ensure that any incoming air is filtered first.
- Use respirators, which are only an interim measure to control exposure to diesel emissions. In most cases, an N95 respirator is adequate. Workers must be trained and fit-tested before they wear respirators. Depending on the type of work being conducted, and if oil is present, concentrations of particulates present will determine the efficiency and type of mask and respirator. Personnel familiar with the selection, care, and use of respirators must perform the fit testing. Respirators must bear a National Institute for Occupational Safety and Health approval number.

NEPA Documentation

- Per Executive Order 13045 on Children's Health,[6] EPA recommends the lead agency and project proponent pay particular attention to worksite proximity to places where children live, learn, and play, such as homes, schools, and playgrounds. Construction emission reduction measures should be strictly implemented near these locations in order to be protective of children's health.
- Specify how effects to sensitive receptors, such as children, elderly, and the infirm will be minimized. For example, locate construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners.

[6] Children may be more highly exposed to contaminants because they generally eat more food, drink more water, and have higher inhalation rates relative to their size. Also, children's normal activities, such as putting their hands in their mouths or playing on the ground, can result in higher exposures to contaminants as compared with adults. Children may be more vulnerable to the toxic effects of contaminants because their bodies and systems are not fully developed, and their growing organs are more easily harmed. EPA views childhood as a sequence of life stages, from conception through fetal development, infancy, and adolescence.