

# Federal Permitting and Environmental Reviews for Nature-Based Solutions

A Best Practices Guide

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# Table of Contents

**Introduction ..... 1**

**Federal Statutes Applicable to NBS Implementation..... 3**

Clean Water Act Section 402 ..... 3

Clean Water Act Section 404..... 4

Coastal Barrier Resources Act..... 5

Coastal Zone Management Act..... 6

Endangered Species Act ..... 6

Magnuson-Stevens Fishery Conservation and Management Act ..... 7

Marine Mammal Protection Act ..... 7

Marine Protection Research and Sanctuaries Action Section 103..... 7

National Environmental Policy Act..... 8

National Historic Preservation Act..... 9

National Flood Insurance Program..... 10

Rivers and Harbors Act Section 10 ..... 11

**Best Practices for NBS Permitting and Environmental Reviews ..... 12**

Create Open Communication through Regional Permitting Networks..... 12

Dedicate Staff for Regional Permitting Programs ..... 13

Increase NBS Knowledge for Federal Permitting and Environmental Review Staff ... 13

Develop Permit Process Mapping ..... 14

Use NEPA Categorical Exclusions..... 14

**Regional NBS Permitting Network Examples ..... 16**

Bay Restoration Regulatory Integration Team (BRRIT)..... 16

Puget Sound Multi-Agency Review Team (MART)..... 17

**Permitting and Environmental Review Case Studies..... 22**

Beaver Restoration of Birch Creek..... 22

Mill River Watershed Urban Green Infrastructure ..... 23

State Route 20 Skagit Riverbank Stabilization..... 24

Windy Hill Living Shoreline..... 25

**Appendix A: NBS Permits, Reviews, Authorizations, and Consultations**

**Appendix B: NBS Resources and Guidance**

**References**

**Tables**

Table 1. BRRIT Summary ..... 16

Table 2. MART Summary..... 18

**Figures**

Figure 1. Example conventional permit process map. From adapted MART diagram (2024). ..... 19

Figure 2. Example streamlined permit process map. From adapted MART diagram (2024). ..... 20

## **Abbreviations and Acronymns**

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|          |  |
|----------|--|
| BRRIT    | Bay Restoration Regulatory Integration Team              |
| CBRA     | Coastal Barrier Resources Act                            |
| CBRS     | John H. Chafee Coastal Barrier Resources System          |
| CE       | Categorical Exclusion                                    |
| CEQ      | Council on Environmental Quality                         |
| CGP      | Construction General Permit                              |
| CLOMR    | Conditional Letter of Map Revision                       |
| CWA      | Clean Water Act  |
| CZMA     | Coastal Zone Management Act                              |
| DNR      | Department of Natural Resources                          |
| EA       | Environmental Assessment                                 |
| EFH      | Essential Fish Habitat                                   |
| EIS      | Environmental Impact Statement                           |
| EPA      | United States Environmental Protection Agency            |
| ESA      | Endangered Species Act                                   |
| FEMA     | Federal Emergency Management Agency                      |
| GIFC     | Green Infrastructure Federal Collaborative               |
| FHWA     | Federal Highway Administration                           |
| FONSI    | Finding of No Significant Impact                         |
| FPRP III | Fish Passage and Restoration Programmatic                |
| HRPP     | Habitat Recovery Pilot Program                           |
| MART     | Puget Sound Multi-Agency Review Team                     |
| MMPA     | Marine Mammal Protection Act                             |
| MPRSA    | Marine Protection Research and Sanctuaries Act           |
| MS4      | Municipal Separate Storm Sewer System                    |
| MSA      | Magnuson-Stevens Fishery Conservation and Management Act |
| NBS      | Nature-Based Solutions                                   |
| NEPA     | National Environmental Policy Act                        |
| NFIP     | National Flood Insurance Program                         |
| NHPA     | National Historic Preservation Act                       |
| NOAA     | National Oceanic and Atmospheric Administration          |
| NPDES    | National Pollutant Discharge Elimination System          |
| NWP      | Nationwide Permit  |
| PGP      | Programmatic General Permit                              |
| RGP      | Regional General Permit                                  |
| RHA      | Rivers and Harbors Act                                   |
| USACE    | United States Army Corps of Engineers                    |
| USFS     | United States Forest Service                             |
| USFWS    | United States Fish and Wildlife Service                  |
| WDFW     | Washington Department of Fish and Wildlife               |
| WSDOT    | Washington State Department of Transportation            |

# Introduction

Nature-based solutions (NBS) are actions to protect, conserve, restore, and sustainably manage natural or modified ecosystems. They use natural features or processes to address public health and environmental challenges while providing multiple benefits to people and nature.<sup>1</sup> One of the benefits of NBS is reducing risks such as flooding, drought, wildfire, and urban heat (Warnell et al., 2023). NBS can also improve water and air quality while supporting biodiversity and habitat connectivity. These benefits positively impact communities by helping them increase resiliency, improve health, and increase access to nature.

The concept of working with nature to address problems is not new; tribal and indigenous communities in the United States have long practiced NBS strategies, which are heavily rooted in Indigenous Knowledge (CEQa, 2022). While this guide uses the term NBS, other organizations may use related terms such as natural infrastructure, natural and nature-based features, or green infrastructure.

The November 2022 [White House Nature-Based Solutions Roadmap](#) identifies strategic recommendations to unlock the potential of NBS (CEQb, 2022). NBS can be implemented as a standalone project (e.g., a living shoreline project) or as part of a larger project (e.g., a bridge repair project that includes restoring a riverbank using NBS techniques). This guide collectively refers to projects that implement NBS as “NBS projects.” While there are numerous examples of successful NBS projects, challenges may arise when implementing NBS, such as federal environmental reviews and permitting. NBS projects may require multiple reviews and permits from different federal agencies using different permitting and resource management authorities, which can result in conflicting requirements and impact project schedules (Gregory et al., 2024; Howarth & Berkowitz, 2024). Additionally, federal permits, reviews, and processes are often written with conventional infrastructure solutions in mind, which can add complexities when evaluating NBS and may also slow the federal permitting and environmental review process (Goodrich et al., 2023).

The [Green Infrastructure Federal Collaborative](#) (GIFC) is an effort that fosters engagement and cooperations between federal agencies that actively work to promote the implementation of green infrastructure and NBS. The GIFC developed this guide to help implement the White House Nature-Based Solutions Roadmap by identifying ways to accelerate federal permitting and environmental reviews for NBS projects. This document is intended to provide federal agencies involved in the review of NBS projects with an overview of the federal permitting and environmental review

## NBS can address:

- **Community resilience**
- **Disaster risk reduction**
- **Economic and social development**
- **Human health**
- **Food and water security**
- **Reversing environmental degradation**
- **Biodiversity loss**

(IUCN, 2020)

1. EPA. Clarification for types of ‘actions’: NBS encompass a wide range of actions that may include the planning, design, and maintenance of engineering practices that restore, use or enhance natural processes (e.g., green infrastructure, agricultural conservation practices, coastal restoration) and/or protect natural features to preserve ecosystem function (e.g., wetlands, forests, riparian areas, coral reefs).

processes related to NBS implementation; best practices recommendations; and examples of NBS projects and successful federal agency permitting networks that have navigated and streamlined these reviews and processes. Ultimately, environmental permitting and approval is project-specific and will depend on the unique characteristics of each project (e.g., location, design, use of federal funding). This guide is meant to further progress towards streamlining the process for implementing NBS projects.

Opportunities for NBS extend across multiple landscapes and land-use settings and range in scope and scale. Examples of NBS projects, adapted from the [Department of Interior's NBS Roadmap](#) (Warnell et al., 2023), are presented in the box below.



Photo Credit: Image provided by Washington State Department of Transit

### Nature-Based Solutions Examples

#### Coastal:

- Assisted marsh migration
- Beach nourishment
- Coastal wetland restoration
- Coral reef restoration
- Dune restoration
- Living shoreline creation
- Mangrove restoration
- Oyster bed restoration
- Seagrass restoration

#### Inland Wetlands:

- Nontidal wetland restoration
- Peatland restoration

#### Forest:

- Forest conservation and restoration
- Green firebreaks
- Thinning

#### Grassland and Sagebrush:

- Grassland conservation and restoration
- Sagebrush conservation and restoration

#### Urban Green Infrastructure:

- Bioretention
- Bioswales
- Urban tree canopy

#### Riverine:

- Beaver management and beaver dam analogs
- Floodplain reconnection
- Riparian buffer restoration
- Riverine connectivity restoration
- Stream restoration

#### Multiple Ecosystems:

- Invasive species, nuisance pest, and pathogen control and removal
- Prescribed burns

## Federal Statutes Applicable to NBS Implementation

Many NBS projects require federal environmental reviews, consultations, and permitting before they can be implemented. NBS projects may also require similar environmental authorizations at the state, territory, tribal, and local levels because they either have delegated authority from a federal statute or have implemented their own laws and regulations that result in additional permitting or authorization requirements. These various layers can result in a complex approval process for NBS projects. This section provides an overview of potentially applicable federal statutes and highlights any permitting, environmental reviews, or consultations required and any approval streamlining mechanisms available under that authority. It also demonstrates that many different federal agencies can be involved in the environmental permitting, consultation, and authorization of an NBS project. Understanding the myriad of authorities that could apply to NBS projects and the agencies that implement them is an important step in increasing coordination and collaboration across agencies.



Note that this section is not an exhaustive list of all federal environmental statutes. Ultimately, the details of each specific project will determine which regulatory authorities need to be involved. See Appendix A for additional details on specific authorities.

### Clean Water Act Section 402

*Implementing Federal Agency: EPA (many states and some territories are authorized to administer the NPDES program)*

Section 402 of the Clean Water Act (CWA)<sup>2</sup> established the National Pollutant Discharge Elimination System (NPDES) permit program. The NPDES permit program addresses water pollution by regulating point sources that discharge pollutants into waters of the United States. NPDES permitting authorities issue both Section 402 general permits and individual permits. An NPDES individual permit is written to reflect site-specific conditions of a single discharger (or in rare instances to multiple co-permittees), whereas an NPDES general permit is written to cover multiple dischargers with similar operations and types of discharges.

An NPDES stormwater construction general permit (CGP) may be required for stormwater discharges from construction activities associated with NBS projects if the construction involves disturbing 1 acre or more of land. CGPs may also be required for stormwater discharges from smaller sites that are part of a larger common plan of development or sale that disturb 1 acre or more of land.

2. [33 U.S.C. § 1342](#)



NPDES permitting authorities also regulate discharges from some municipal separate storm sewer systems (MS4s). NPDES MS4 permits are required to address minimum elements. In addition, they require regulated MS4 owners or operators to develop, implement, and enforce a program to reduce pollutants in any stormwater runoff into the MS4 from certain post-construction activities. These permits generally require regulated MS4 owners or operators to:

- Develop and implement strategies that include a combination of structural and/or non-structural best management practices appropriate for the community.
- Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under state, tribal, or local law.
- Ensure adequate long-term operation and maintenance of best management practices.

There may be additional local requirements, permits, or approval for certain NBS strategies.<sup>3</sup>

## **Clean Water Act Section 404**

*Implementing Federal Agencies: USACE and EPA (Michigan and New Jersey have assumed the Section 404 program in their states pursuant to Section 404[g] of the CWA)*

Section 404 of the CWA<sup>4</sup> establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including jurisdictional wetlands. The U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA) jointly administer the program. USACE implements the Section 404 program on a day-to-day basis and can authorize activities via a general or individual permit depending on the project details and impacts. EPA provides guidance and policy development, determines the scope of geographic jurisdiction, reviews and comments on potential permit actions and mitigation proposals, conducts enforcement, approves and oversees tribal and state Section 404 programs, and can prohibit, deny, or restrict an area's use as a disposal site.

USACE general permits, which account for 94 percent of issued authorizations under Section 404, are intended to provide a faster, more streamlined approval process for defined categories of activities with discharges that result in only minimal adverse effects to the environment. These permits can be applicable nationally or only in certain regions or states.<sup>5</sup> USACE general permits include Nationwide Permits (NWP), Regional General Permits (RGPs), and Programmatic General Permits (PGPs). USACE divisions and districts may add regional and project-specific conditions to NWPs, and USACE districts may develop RGPs to address state or regional laws and environmental concerns.

3. Additionally, pursuant to Section 401 of the CWA, a federal agency may not issue a permit or license to conduct any activity that may result in any discharge into waters of the United States unless a Section 401 water quality certification is issued or waived. States and authorized tribes where the discharge would originate are generally responsible for issuing water quality certifications. In cases where a state or tribe does not have authority, EPA is responsible for issuing certification. Currently, EPA acts as the certifying authority in two scenarios: (1) on behalf of tribes without treatment in a similar manner as a state for Section 401 and (2) on lands of exclusive federal jurisdiction in relevant respects.

4. [33 U.S.C. § 1344](#)

5. [33 CFR Part 330](#)

Examples of potential USACE NWP that can be utilized for NBS work include:

- **NWP 13 - Bank Stabilization.** Authorizes bank stabilization activities that control or prevent erosion, among other requirements.
- **NWP 27: Aquatic Habitat Restoration, Enhancement, and Establishment Activities.** Authorizes a variety of restoration activities in aquatic habitats that increase ecosystem function, among other requirements.
- **NWP 43: Stormwater Management Facilities.** Authorizes discharges of dredged or fill material for the construction of stormwater management facilities.
- **NWP 54: Living Shorelines.** Authorizes living shorelines up to 500 feet in length.
- **NWP 59: Water Reclamation and Reuse Facilities.** Authorizes discharges of dredged or fill material for the construction, expansion, and maintenance of water reclamation and reuse facilities, including vegetated areas enhanced to improve water infiltration and constructed wetlands to improve water quality.

NWP 13 is an example of numerous USACE NWP that, in some regions, have additional regional conditions by a USACE district and/or state that require projects to use NBS techniques, unless demonstrated to be infeasible.

Examples of Section 404 PGPs related to NBS include the [New Orleans District PGP](#) with the Louisiana Department of Natural Resources—which authorizes oyster reefs, living shorelines, and coastal marsh restoration projects—and the Baltimore District PGP with the Maryland Department of the Environment ([MDSPGP-6](#)), which includes activities such as an aquatic habitat restoration and living shorelines.<sup>6</sup>

## Coastal Barrier Resources Act

*Implementing Federal Agency: USFWS*

The Coastal Barrier Resources Act (CBRA) established the John H. Chafee Coastal Barrier Resources System (CBRS), a defined set of geographic units along the Atlantic, Gulf of Mexico, Great Lakes, U.S. Virgin Islands, and Puerto Rico coasts (System Units of the CBRS). The CBRA encourages the conservation of hurricane-prone and biologically rich coastal barriers. No new federal expenditures or financial assistance may be made available within the System Units of the CBRS—including for constructing or purchasing roads, structures, facilities, or related infrastructure, and for most projects to prevent the erosion of or otherwise stabilize any inlet, shoreline, or inshore area. However, after consultation with the U.S. Fish and Wildlife Service (USFWS), a federal agency may make federal expenditures and financial assistance available within System Units for activities meeting one of the [exceptions](#) under the CBRA, which include some NBS, such as shoreline stabilization and fish and wildlife habitat enhancements. The CBRA does not prohibit or restrict development conducted with non-federal funds, nor does it prohibit federal agencies from issuing federal permits.

Federal agencies proposing to spend funds affecting a System Unit of the CBRS should initiate the [consultation process](#) in the early stages of project planning. Federal agencies may request technical assistance from the appropriate [Ecological Services Field Office](#).

6. Refer to footnote 3.



## Coastal Zone Management Act

*Implementing Federal Agency: NOAA National Ocean Service Office for Coastal Management*

The [Coastal Zone Management Act \(CZMA\)](#)<sup>7</sup> is administered by states subject to the National Oceanic and Atmospheric Administration (NOAA) oversight, and it provides for the management of the nation's coastal resources. [CZMA Section 307](#) gives states a strong voice in activities requiring a federal license or permit, as well as federal agency activities that may affect a state's coastal use or resources.<sup>8</sup> Federal consistency requires that federal actions within or outside the coastal zone, which have reasonably foreseeable effects on any coastal use (land or water) or natural resource of the coastal zone, be consistent with the enforceable policies of a state's federally approved coastal management program. Federal actions include federal agency activities, license or permit activities, and financial assistance activities. NOAA oversees the CZMA, and the various subparts of NOAA's CZMA federal regulations determine when a federal action is subject to state CZMA federal consistency review.<sup>9</sup> Coastal states are encouraged to develop and implement coastal zone management plans as a basis for protecting, restoring, and establishing a responsibility in preserving and developing the nation's coastal communities and resources.

## Endangered Species Act

*Implementing Federal Agencies: NOAA Fisheries and USFWS*

The Endangered Species Act (ESA)<sup>10</sup> requires consultation by federal agencies for actions they fund, authorize, or carry out that may affect ESA-listed fish, wildlife, plants, or critical habitats. The ESA also provides for interagency cooperation to avoid take of listed species and for conducting consultations and providing authorizations for otherwise prohibited activities. In this context, "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect an ESA-listed species, or attempt any of these actions against a listed species. NOAA National Marine Fisheries Service (NOAA Fisheries) and USFWS, collectively referred to as "the Services," share responsibility for implementing the ESA. NOAA Fisheries is responsible for protecting, conserving, and recovering marine and anadromous species listed under the ESA. USFWS is responsible for terrestrial and freshwater species, as well as sea birds, sea otters, manatees, and polar bears. The two agencies share jurisdiction over species such as sea turtles, Gulf Sturgeon, and Atlantic salmon. Interagency cooperation under ESA Section 7<sup>11</sup> provides a mechanism for federal agencies to work with the Services to fulfill their obligation to consult. The Services can help determine what type of consultation is necessary and what information is required for consultation with [NOAA Fisheries](#) or [USFWS](#).

The Services continue to develop efficiencies in the consultation process, including using programmatic approaches, standing analyses and determination keys, and web-based delivery for consultation aids. Section 7 programmatic consultations address a federal agency's multiple actions on a program, geographic region, or other basis. A programmatic approach streamlines

7. [16 U.S.C. § 1451 et seq.](#)

8. [16 USC § 1456](#)

9. [15 CFR Part 930](#)

10. [16 U.S.C. § 1531-44](#)

11. [16 U.S.C. § 1536](#)

the procedures and time involved in consultations for broad agency programs or multiple similar, frequently occurring, or routine actions with predictable effects on listed species and/or critical habitat, thus reducing the amount of time spent on individual project consultations. USFWS's [Information for Planning and Consultation](#) web-based platform provides species information, potential conservation measures, and in some cases consultation documents for selected activities and species. Specific examples of programmatic consultations are provided in the Puget Sound Multi-Agency Review Team section of this guide.

## **Magnuson-Stevens Fishery Conservation and Management Act**

*Implementing Federal Agency: NOAA Fisheries*

The Magnuson-Stevens Fishery Conservation and Management Act (MSA)<sup>12</sup> is the primary law that governs marine fisheries management in U.S. waters. MSA fosters the long-term biological and economic sustainability of marine fisheries. It protects areas designated as Essential Fish Habitat (EFH) and requires federal agencies to [consult with NOAA Fisheries](#) to avoid, reduce, or compensate for any adverse effects to these habitats. NOAA Fisheries provides maps and/or other information on the locations of EFH to help determine if a proposed action is located within or adjacent to EFH, as well as information on ways to promote conservation of EFH and to facilitate an EFH assessment.

## **Marine Mammal Protection Act**

*Implementing Federal Agencies: NOAA Fisheries and USFWS*

The Marine Mammal Protection Act (MMPA)<sup>13</sup> establishes a national policy to prevent marine mammal species and population stocks from declining beyond the point where they cease to be significant functioning elements of the ecosystems of which they are a part. MMPA has a moratorium on taking and importing marine mammals—including parts and products—and defines certain key federal responsibilities for conserving marine mammals. In this context, “take” means to hunt, harass, capture, or kill any marine mammal, or attempt to do so. Sponsors of projects that may impact marine mammals protected under the Marine Mammal Protection Act should consult with NOAA Fisheries or USFWS, as appropriate, regarding the need for an [incidental take authorization](#).

## **Marine Protection Research and Sanctuaries Action Section 103**

*Implementing Federal Agencies: EPA and USACE*

The Marine Protection Research and Sanctuaries Act (MPRSA)<sup>14</sup> regulates the transportation and disposition of material in ocean waters and generally prohibits the disposition of material into the ocean that would unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities. The MPRSA applies in ocean waters which extend seaward of the baseline from which the territorial sea is measured and

12. [16 U.S.C. § 1801 et seq.](#)

13. [16 U.S.C. § 1361 et seq.](#)

14. [33 U.S.C. § 1401 et seq.](#)

include the territorial seas, the contiguous zone, the U.S. exclusive economic zone and the high seas extending to the exclusive economic zone of another country. The EPA and the USACE share regulatory responsibilities under the MPRSA. Among other things, the EPA establishes criteria for all MPRSA permits and MPRSA ocean sites and is the permitting authority for all materials other than dredged material. MPRSA permits for ocean disposal of dredged material and federal projects involving the disposal of dredged material are issued by USACE, subject to EPA's review and written concurrence. Evaluations of the suitability of dredged material for ocean disposal include evaluating alternatives to disposal, which may include dredged material use for beach nourishment or other nature-based options.

## National Environmental Policy Act

### *Implementing Federal Agencies: Most federal agencies*

Activities with a federal nexus are subject to the National Environmental Policy Act (NEPA)<sup>15</sup> requirements. NEPA requires federal agencies to assess the environmental effects of their proposed actions and to coordinate and consult with other government agencies prior to making decisions. In addition, it requires participation from the public to help inform decision-making. NEPA is triggered by a range of federal actions, including funding and permit decision-making. Each federal agency has its own implementing regulations and has adopted its own procedures for NEPA. A NEPA review typically involves evaluating the environmental and related social and economic effects of the proposed action. When NBS are implemented as part of a larger project, such as a highway or bridge project, the NEPA review considers the project as a whole. The White House Council on Environmental Quality's (CEQ's) NEPA implementing regulations provide flexibility for federal agencies to eliminate duplication of efforts, adopt previous determinations if applicable, and rely on existing information as appropriate through the NEPA process.<sup>16</sup> As part of a NEPA review, federal agencies may integrate other federal permitting requirements or environmental reviews.

There are different levels of assessment for NEPA compliance, all of which require documentation:

- **Categorical exclusion (CE).** Normally issued within one week or up to two months after adoption is complete, a CE is a category of actions that a federal agency has determined in its NEPA procedures—after review by CEQ—normally does not have a significant effect on the human environment<sup>17</sup> and, therefore, neither an Environmental Assessment (EA) nor an Environmental Impact Statement (EIS) is required. Agencies have the flexibility to adopt another agency's CE by consulting with the agency that established it and then providing public notice of the adoption. This process must be completed before the non-establishing agency can use the CE.
- **Environmental Assessment (EA).** A decision document generally issued within one year, an EA determines whether or not a federal action has the potential to cause significant environmental effects. An EA briefly discusses the purpose and need for the proposed action, alternatives, and their environmental effects. It also includes sufficient evidence for determining whether or not to prepare an EIS. If the agency determines that the action

15. [42 U.S.C. § 4321 et seq.](#)

16. [40 CFR § 1506.2](#), [40 CFR § 1506.3](#), [40 CFR § 1506.6](#)

17. [40 CFR 1508.1\(e\)](#)



will not have significant environmental impacts, the agency will issue a Finding of No Significant Impact (FONSI). A FONSI is a document that presents the reasons why the agency has concluded there are no significant environmental impacts projected to occur upon implementing the action. If the EA determines the impacts of the proposed federal action will be significant, an EIS is prepared.

- **Environmental Impact Statement (EIS).** A decision document generally issued within two years, an EIS is required by NEPA if a proposed major federal action is determined to significantly affect the quality of the human environment. An EIS discusses the purpose and need of a proposed action, the range of alternatives to the proposed action, a description of the affected environment, and the significant effects on the environment from a proposed action to inform decisions-makers and the public. An EIS is a tool for decision-making that helps to identify and mitigate the environmental impacts of a project.

## National Historic Preservation Act

*Implementing Federal Agencies: All federal agencies, SHPOs, THPOs*

The National Historic Preservation Act (NHPA)<sup>18</sup> establishes a national preservation program and a system of procedural protections for proposed federal undertakings, which encourage the federal government, states, and tribes to both identify and protect historic resources, including archeological resources. NHPA Section 106<sup>19</sup> and its implementing regulations<sup>20</sup> were promulgated to ensure federal agencies conduct a review of the potential effects of federally licensed, assisted, regulated, or funded activities on historic properties listed or eligible for listing on the National Register of Historic Places. The National Register is the official federal inventory of districts, sites, buildings, structures, and objects significant on a national, state, or local level regarding American history, architecture, archeology, engineering, or culture. Section 106 review requires the federal agency, before issuing a license (i.e., permit), to identify areas of potential effect and adopt measures—when feasible—to mitigate potential adverse effects of the licensed activity and properties listed or eligible for listing in the National Register. Federal agencies must implement NHPA's requirements in cooperation with state historic preservation officers (SHPOs) and tribal historic preservation officers (THPOs). Upon notice and when appropriate, federal agencies must also consult with the Advisory Council on Historic Preservation.

Federal agencies may develop programmatic agreements to satisfy the requirements of the NHPA for more efficient and consistent reviews. Several NHPA [nationwide programmatic agreements](#) currently exist, including agreements between the Advisory Council on Historic Preservation and the U.S. Forest Service (USFS), Department of Defense, Department of the Interior, and Department of Housing and Urban Development.

18. [54 U.S.C. § 300101 et seq.](#)

19. [54 U.S.C. § 306108](#)

20. [36 CFR Part 800](#)

## National Flood Insurance Program

### *Implementing Federal Agency: FEMA*

The National Flood Insurance Program (NFIP) was established with the passage of the National Flood Insurance Act of 1968.<sup>21</sup> Communities that participate in the NFIP and have been provided with floodway data by the Federal Emergency Management Agency (FEMA) are required to adopt and enforce the FEMA mapped regulatory floodways<sup>22</sup> and corresponding floodplain management requirements. Once a community has adopted a regulatory floodway, development is restricted in the floodway unless it has been demonstrated through hydrologic and hydraulic analyses (performed using a FEMA-approved engineering model) that the development will not result in any increase to the base flood elevation within the floodway. These analyses must show no increase of base flood levels in the mapped regulatory floodway on FEMA's Flood Insurance Rate Maps.

Any project that will occur in a floodway must be reviewed to determine if it will increase flood heights through a “no-rise” or “zero-rise” analysis before the community can issue a permit for floodway development. The community's permit file must have a record of the results of this analysis, which can be in the form of a “no-rise” or “zero-rise” certification from a qualified registered professional engineer. If the project will cause an increase above the allowed flood level in the floodway, then the permittee must assess risk to potentially affected properties and submit a Conditional Letter of Map Revision (CLOMR) for FEMA review before the community can issue a floodplain development permit.

It is the community's responsibility to determine the impacts of proposed development in the regulatory floodway, whether they do the analysis in-house, contract with an engineer, or require the applicant to submit the analysis and supporting documentation. FEMA provides some broad, general guidance on reviewing floodway encroachment analysis. States may have specific guidance on determining impacts and documenting the results as part of the state/local permit process. For instance, some communities may require (as a higher standard) submission of a CLOMR/Letter of Map Revision for all floodway development and not just encroachments that cause an increase in flood hazards. That way, the community's map reflects current conditions regardless of whether the development resulted in increases or decreases of the width or depth of flooding. FEMA encourages communities to consult their State NFIP Coordinator or FEMA Regional Office for tailored technical assistance and guidance on floodway encroachment reviews and preparing CLOMR submittals.

NBS projects such as floodplain reconnection or restoration often cause an increase in the allowed base flood elevation and are subject to CLOMR reviews before projects can be permitted. Several states directly regulate all or most development in floodways and review and approve permits for floodway development. The states may conduct the CLOMR reviews instead of FEMA. Both a state permit and a permit from the community may be required for a floodway or floodplain development in these states (FEMA, 2021).

21. [42 U.S.C. § 4001 et seq.](#)

22. Regulatory floodways are: “the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height” ([FEMA](#)).

## Rivers and Harbors Act Section 10

### Implementing Federal Agency: USACE

The Rivers and Harbors Act (RHA) of 1899<sup>23</sup> is the initial authority for the USACE regulatory permit program to protect navigable waters when developing harbors and undergoing other construction and excavation. Section 10 of the RHA regulates actions that are part of many NBS projects, including changes to dams or dikes in navigable waters; excavation, dredging, or disposal in navigable waters; any actions that modify the condition, course, or location of a navigable waterway; and discharges of dredged or fill material into waterways.<sup>24</sup> Depending on the specific project and location, proposed activities regulated by the RHA may be authorized by either a USACE general permit or an individual permit. USACE individual permits are customized for specific activities that do not qualify for a USACE general permit.

USACE general permits are intended to provide a faster, more streamlined approval process for defined categories of activities that result in only minimal adverse effects to the environment. They may be applicable nationally or only in certain regions or states.<sup>5</sup> USACE general permits include NWP, RGP, and PGP. USACE divisions and districts may add regional and project-specific conditions to NWPs, and USACE districts may develop RGPs to address state or regional laws and environmental concerns.

Examples of potential USACE general permits that can be utilized for NBS work include, [NWP 13](#): Bank Stabilization; [NWP 27](#): Aquatic Habitat Restoration, Enhancement, and Establishment Activities; and [NWP 54](#): Living Shorelines.

NWP 13 is example of numerous USACE NWPs that, in some regions, have additional regional conditions by a USACE district and/or state that require projects to use NBS techniques, unless demonstrated to be infeasible.



*Photo Credit: Image provided by Dawn Henning, City of New Haven, Connecticut.*

23. [33 U.S.C. § 401 et seq.](#)

24. [33 CFR Part 320](#)



## **Best Practices for NBS Permitting and Environmental Reviews**

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This section builds on the recommendations from the White House Nature-Based Solutions Roadmap (CEQb, 2022), discussion at the February 2024 Policy Forum on Nature-Based Solutions, experience of the contributing agencies of the GIFIC permitting implementation committee, and the shared experiences from other federal and private NBS practitioners, regulators, and resource managers. The best practices below are intended to be actionable within the current permitting and environmental review landscape. They can apply to individual projects, at the regional scale, and to decision-making within federal agencies.

### **Create Open Communication through Regional Permitting Networks**

NBS project permit requirements are site-specific and therefore will have more similarities within geographic regions rather than on a national scale. Regulatory agencies within a region can work together to more efficiently implement NBS projects. Interagency coordination and collaboration through regional permitting networks could improve efficiency as project teams navigate the environmental permitting and review process. These networks provide a space for federal, state, tribal, and regional regulatory authorities to collaborate on improving the overall permitting and approval process and on permitting specific projects.

Best practices for regional permitting networks include establishing a charter, clearly identifying roles of each agency and their authorities, meeting regularly, establishing a central workspace (e.g., SharePoint), collaborating on permitting problem solving, committing to continuous improvement, and setting up an accountability mechanism for permitting agencies throughout the permitting process.

An important step provided through regional permitting networks is early engagement, including interagency pre-application meetings for projects. During these meetings, regulators and applicants can work together before formally applying for a permit or entering a consultation, which allows for potential conflicts or issues to be identified and prevents impacts to the project schedule or changes to project designs later in the process. After this early engagement, regional permitting networks can regularly track permitting progress with both the applicants and the agencies and use a team approach to resolving issues as they arise. These steps keep projects on schedule and provide clarity and transparency about the permitting process for the permittees.

Regional permitting networks have successfully streamlined the NBS project permitting and approval process in several geographic areas, as seen in the following section. Expanding the use of regional permitting networks is a beneficial practice that can result in accelerated implementation of NBS projects and their benefits to the ecosystem. This model of communication can also be created and fostered outside of formal regional permitting networks or on a project-specific basis.



## **Dedicate Staff for Regional Permitting Programs**

Federal permitting staff with regional permitting knowledge can be a critical resource for every phase of a project, from pre-application meetings to project decision-making, permit process mapping, and process tracking and implementation. If an agency has the necessary funding authority to accept outside funds, this may help facilitate strategic planning that enables policy, guidance changes, and interagency agreements that span multiple federal, state, and local partners. For example, some federal agencies have dedicated transportation liaisons funded by public entities. These liaisons review projects funded by the Federal Highway Administration (FHWA) and help build strong working relationships between transportation and resource agencies. These liaisons facilitate early coordination, review transportation projects, and respond to state departments of transportation priorities, which can ensure the long-term stability and continuation of permitting efficiencies over time.

Another way to build capacity for NBS expertise is to use pre-established authorizations that allow federal agencies to lead or support a streamlined permitting process specific to NBS projects. An example is EPA dedicating resources for a project manager or permitting staff as part of the Puget Sound Multi-Agency Review Team (MART). Another example includes Water Resources Development Act funding that creates capacity for positions in agencies that are dedicated to a single organization, such as with Snohomish County in Washington State. Interagency agreements like memoranda of understanding can also help establish expectations or protocols between federal agencies regarding NBS permitting and serve as a basis for building future capacity that is dedicated to NBS permitting.

Agencies can also dedicate permitting staff for NBS projects. Staff who are dedicated to performing permitting actions for NBS projects rather than splitting time between multiple priorities will be more successful and effective in reviewing projects, conducting consultations, and issuing permits. Providing regional permitting programs appropriately with staff from each federal agency with NBS expertise is an investment in the effectiveness and future sustainability of NBS projects.

## **Increase NBS Knowledge for Federal Permitting and Environmental Review Staff**

Permitting and environmental review staff may need training and time to develop and maintain expertise in NBS and learn how to develop and navigate federal permitting for NBS projects. Staff trainings can share NBS project permitting success stories, such as the case studies in this guide. Trainings can also highlight how NBS projects differ from conventional development projects, as well as how they can be permitted and approved under programmatic and/or streamlined authorizations that differ from those for conventional projects. Agencies can develop policies and directives for their permitting and staff that explain how NBS can fit into existing permits and requirements.

Interagency training may also provide valuable opportunities to share knowledge and best practices across the federal family of regulatory and resource agencies. Training could be delivered in multiple formats, including:

- **On-demand virtual trainings** such as those provided through [NOAA's Office of Coastal Management](#).
- **Webinars offered through existing NBS-focused programs** like the USACE Engineering with Nature program or professional societies like the National Association of Wetland Managers or Society of Wetland Scientists.
- **In-person short courses** for NBS-focused permitting and environmental reviews.

Additionally, interactive workshops held at the local or regional scale with regulatory and resource agencies, as well as practitioners, can enhance knowledge sharing and help develop best practices. These workshops can also support federal agencies as they operationalize best practices.

Trainings may need to address NBS tools and methodologies to close information gaps and inform decision-making, such as new resources to help quantify the benefits and evaluate the impacts of NBS. Addressing data gaps may also lead to the development of new programmatic agreements for consultation requirements and/or new expedited permitting mechanisms (e.g., new NBS-focused general permits).

## **Develop Permit Process Mapping**

Agency permitting staff are experts in how their own agency's permitting processes work, but a key part of streamlining the overall process is improving interagency communication and understanding other federal agencies' requirements related to authorizing NBS projects. The previous section of this guide provided an overview of those requirements and serves as a starting point for federal agencies to see how their requirements may interact with one another so agencies can identify efficiencies.

Regional permit process mapping is a helpful tool for both regulatory agencies (federal, state, and local) and project applicants, because permitting can often be complex. Process mapping enables a shared understanding of each agency's role, authorities, and limitations, while also providing a clear path to permit requirements prior to application submittal. Establishing the permitting landscape and relative timelines increases transparency and stakeholder understanding. It also provides an opportunity to identify and leverage available permitting and approval streamlining mechanisms, such as programmatic consultations.

An example of this is the Federal Permitting Improvement Steering Council's (Permitting Council's) existing [permitting dashboard](#) and timetable. The Permitting Council was established in 2015 by Title 41 of the Fixing America's Surface Transportation (FAST) Act (FAST-41) to improve the transparency, predictability, and outcomes of the federal environmental review and authorization process for certain large-scale critical infrastructure projects. The FAST-41 process provides agencies with tools to efficiently coordinate federal environmental reviews and authorizations for covered infrastructure projects across various sectors, some include renewable or conventional energy production, surface transportation, and water resources. Their permitting dashboard identifies and tracks interagency permitting and environmental review timelines. This highlights how permit process mapping can bring a more unified and coordinated approach to permitting NBS projects. Another example of permit process mapping developed by MART is presented in the following chapter.

## **Use NEPA Categorical Exclusions**

As discussed in the previous chapter, NEPA CEs are a category of actions that a federal agency has determined normally do not have a significant impact on the environment and therefore do not require an EA nor an EIS. Identifying and using CEs that apply to NBS projects could be a way to streamline NEPA reviews for those projects. As previously noted, NEPA reviews consider the project as whole; therefore, a CE must apply to any portion of the project with a federal nexus, such as federal funding or a federal permit requirement.<sup>25</sup>

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25. [42 USC Ch. 55](#)



Each agency has defined its own CEs, and federal agency staff conducting NEPA reviews and those involved in authorizing NBS projects should be aware of the CEs available and how NBS projects may fit into those CEs (see the text box below for examples). Recently, Section 109 of the 2023 Fiscal Responsibility Act gave federal agencies the flexibility to adopt another agency's CE, meaning federal agencies can adopt an existing CE without going through a notice and comment process but must consult with the establishing agency and then provide public notice of the adoption.<sup>26</sup> While Congress can mandate new CEs or modify existing ones, agencies themselves and the CEQ have administrative authority to create or adjust CEs within their regulatory purview, and Executive Orders may also prompt CEs by directing agencies to focus on specific types of projects or streamlined processes. To streamline NEPA reviews for NBS projects, federal agencies could review CEs for other agencies and determine which ones they could adopt to accelerate implementation of NBS projects. For example, if an agency often funds or conducts stream restoration that agency may want to adopt CEs that could apply to stream restoration from other agencies. A comprehensive list of CEs organized by federal agency and the guidance on how to adopt another federal agency's CE are provided on [CEQ's NEPA Categorical Exclusion page](#).

### **Example NBS types and example agencies with a CE that may apply:**

- Assisted marsh migration (NOAA)
- Beaver management and beaver dam analogs (USFWS)
- Floodplain reconnection (National Resources Conservation Service)
- Forest conservation and restoration (National Park Service)
- Grassland conservation and restoration (USFS)
- Green firebreaks (USFS)
- Invasive species and nuisance pest and pathogen control and removal (Federal Bureau of Investigation)
- Mangrove restoration (USFS)
- Nontidal wetland restoration (Tennessee Valley Authority)
- Prescribed burns (USFWS)
- Riparian buffer restoration (Department of Homeland Security)
- Riverine connectivity restoration (USFS)
- Sagebrush conservation and restoration (USFS)
- Seagrass restoration (NOAA)
- Thinning (Bureau of Land Management)
- Urban green infrastructure (EPA)

26. [Adoption of Categorical Exclusions Under Section 109 of the National Environmental Policy Act](#)

## Regional NBS Permitting Network Examples

This section highlights the implementation of several best practices in this guide using two examples of successful regional permitting networks that show the benefit of developing interagency teams that include federal, state, and local partners. These networks create open communication and build capacity by investing in dedicated staff for regional permitting programs. They serve as examples for other existing regional networks and for new networks.

### Bay Restoration Regulatory Integration Team (BRRIT)

BRRIT was formed to improve the permitting process for multi-benefit habitat restoration projects and associated flood management and public access infrastructure in the San Francisco Bay and along the shoreline of the nine Bay Area counties (excluding the Delta Primary Zone). BRRIT assists applicants by having dedicated staff at each permitting agency available for pre-application discussions. They provide guidance on regulatory requirements, clarification on permitting pathways, and written responses to planning and design documents to help build trust in the permitting process. BRRIT projects are selected by the San Francisco Bay Restoration Authority, which solicits and evaluates proposals based on established criteria for restoration projects in the Bay Area.

**Table 1. BRRIT Summary**

|                                   |   |
|-----------------------------------|---|
| <b>Budget</b>                     | \$6 million for five years (2019–2024).   |
| <b>Contributing Organizations</b> | San Francisco Bay Restoration Authority (Measure AA), State Coastal Conservancy, Bay Toll Authority, East Bay Regional Park District, and Santa Clara Valley Water District.  |
| <b>Participating Agencies</b>     | <b>Federal:</b> EPA, NOAA, USACE, USFWS.<br><b>State:</b> San Francisco Bay Water Board, California Department of Fish and Wildlife.<br><b>Regional/local:</b> <a href="#">San Francisco Bay Conservation and Development Commission</a> .  |
| <b>Governance</b>                 | San Francisco Bay Restoration Authority Policy and Management Committee; representatives from all participating agencies.   |
| <b>Challenges</b>                 | <ul style="list-style-type: none"> <li>• Many agencies, many regulations.</li> <li>• Differing and sometimes competing agency mandates (e.g., habitat protection versus providing public access).</li> <li>• Regulations were not developed with restoration in mind</li> <li>• Sea level rise and urban infrastructure constraints.</li> </ul> |
| <b>Successes</b>                  | 20 projects permitted, of which two have been completed; projects include 36 permits issued or approved.  |
| <b>Keys to Success</b>            | <ul style="list-style-type: none"> <li>• Identification of potential conflicts before design is final, including through pre-application meetings.</li> <li>• Collaboration between agencies and applicants to resolve issues.</li> <li>• Dedicated funding and resources for permit managers of BRRIT projects.</li> </ul>                     |
| <b>Website</b>                    | <a href="https://www.sfbayrestore.org/san-francisco-bay-restoration-regulatory-integration-team-brrit">https://www.sfbayrestore.org/san-francisco-bay-restoration-regulatory-integration-team-brrit</a>   |
| <b>Contact</b>                    | <a href="mailto:BRRIT@waterboards.ca.gov">BRRIT@waterboards.ca.gov</a>  |

BRRIT's success is the result of many factors, one of which is continual communication both with applicants and amongst the team. BRRIT operates in close coordination with applicants and regulatory and resource agencies. This coordination happens early in the application process with a pre-application meeting, and frequently throughout the permitting process. BRRIT also provides many resources and tools on their website for permittees to refer to when planning a restoration project. In addition, BRRIT members collaborate internally to ensure an efficient review and approval process. Members use SharePoint to collaborate in parallel rather than individually by agency. Satisfaction surveys and other post-permit interviews are part of the BRRIT approach to ensure there is a feedback loop to continue to improve the services BRRIT is providing to permittees. The Policy and Management Committee, a group of manager-level representatives from each agency, meets monthly to work with BRRIT to identify and resolve regulatory and policy issues limiting restoration progress that cannot be resolved at an individual project level. Finally, BRRIT has dedicated program funding that allows time and resources to be used without impacting current regulatory agency staffing budgets.

## **Puget Sound Multi-Agency Review Team (MART)**

MART is a team of federal and state regulatory staff working together to streamline the permitting process for habitat recovery projects in the Puget Sound Basin. MART uses a facilitated, coordinated team approach to help permit ecologically beneficial projects in both marine and freshwater environments. Efforts focus on expediting the federal permitting process in coordination with state and local permits. MART is informed about potential projects by their partners and the Puget Sound recovery community. For each project, the MART facilitator reaches out to the applicant and directs them to project-specific agency contacts and permitting requirements. The applicant will then have a pre-application meeting with MART members to obtain necessary information at the local, state, and federal levels before submitting their application. These MART members hold monthly status check-ins on the project to troubleshoot and coordinate interdependent permits. MART also practices continuous improvement by assessing its process and implementing changes when needed.





**Table 2. MART Summary**

|                                   |   |
|-----------------------------------|---|
| <b>Budget</b>                     | 0.10–0.20 full-time equivalent from organizations listed below.   |
| <b>Contributing Organizations</b> | EPA, USFWS, FEMA, NOAA Fisheries. Supported by the Puget Sound Federal <a href="#">Leadership Task Force</a> and the Puget Sound National Estuary Program.  |
| <b>Participating Agencies</b>     | <b>Federal:</b> EPA, USACE, USFWS, FEMA, NOAA Fisheries.<br><b>State:</b> Washington Department of Fish and Wildlife (WDFW), Department of Ecology, and Department of Natural Resources.<br><b>Regional/local:</b> Puget Sound Partnership and coordination with local jurisdictions.   |
| <b>Governance</b>                 | Facilitated and led by EPA. Representatives from all agencies listed above. Created a governing document (or charter).  |
| <b>Challenges</b>                 | <ul style="list-style-type: none"> <li>• Many agencies, many regulations and requirements.</li> <li>• Siloing of federal, state, and local agency permitting processes.</li> <li>• Lack of communication and collaboration among agencies.</li> <li>• Differing and sometimes competing agency mandates (e.g., habitat protection versus providing public access).</li> <li>• Unclear permit pathways and timelines for project implementers.</li> <li>• Lack of consistent and available permit agency contacts.</li> <li>• Regulations were not developed with restoration in mind.</li> <li>• Inadequate permit agency staff capacity causes delays in permit issuance, especially with increased project demand.</li> </ul> |
| <b>Successes</b>                  | Six projects permitted out of 10 assisted by MART process; dedicated and active federal staff.  |
| <b>Keys to Success</b>            | <ul style="list-style-type: none"> <li>• Increase capacity of permit agency staff.</li> <li>• Dedicate agency staff at USACE, NOAA, USFWS, and FEMA to work solely on restoration project permitting.</li> <li>• Develop and track emerging streamlined permitting efforts and disseminate information to project proponents.</li> <li>• Continued national and regional level support and funding for MART.</li> <li>• Create an online application that can send a single application form to each agency.</li> </ul>   |
| <b>Website</b>                    | <a href="https://www.psp.wa.gov/MART.php">https://www.psp.wa.gov/MART.php</a>   |
| <b>Contact</b>                    | Diane Hennessey, EPA, <a href="mailto:Hennessey.diane@epa.gov">Hennessey.diane@epa.gov</a>  |

MART brings federal, state, and local agencies together at the start of the permitting process rather than having agencies work on review and approval one at a time. This collaboration brings a coordinated team approach to permitting in the Puget Sound. MART works directly with the applicant to identify which paths they should go down to streamline an otherwise unclear process. The relevant permitting staff are involved from the beginning, which gives applicants points of contact throughout the process. Staff also aid in navigating the federal permitting process, which reduces permit processing time. Federal permit processing time for nearly all MART projects has been 30 percent less than the average project.

One of the tools MART has used to reduce federal permit processing time is permit process mapping. MART and the Habitat Recovery Pilot Program (HRPP) developed permit process maps for habitat restoration projects in Washington State, as shown in Figure 1. The map below highlights the complex processes, permits, and estimated timelines that are typically required using conventional pathways. The estimated timeline to receive all permits and authorizations required was 1 to 2.5 years.

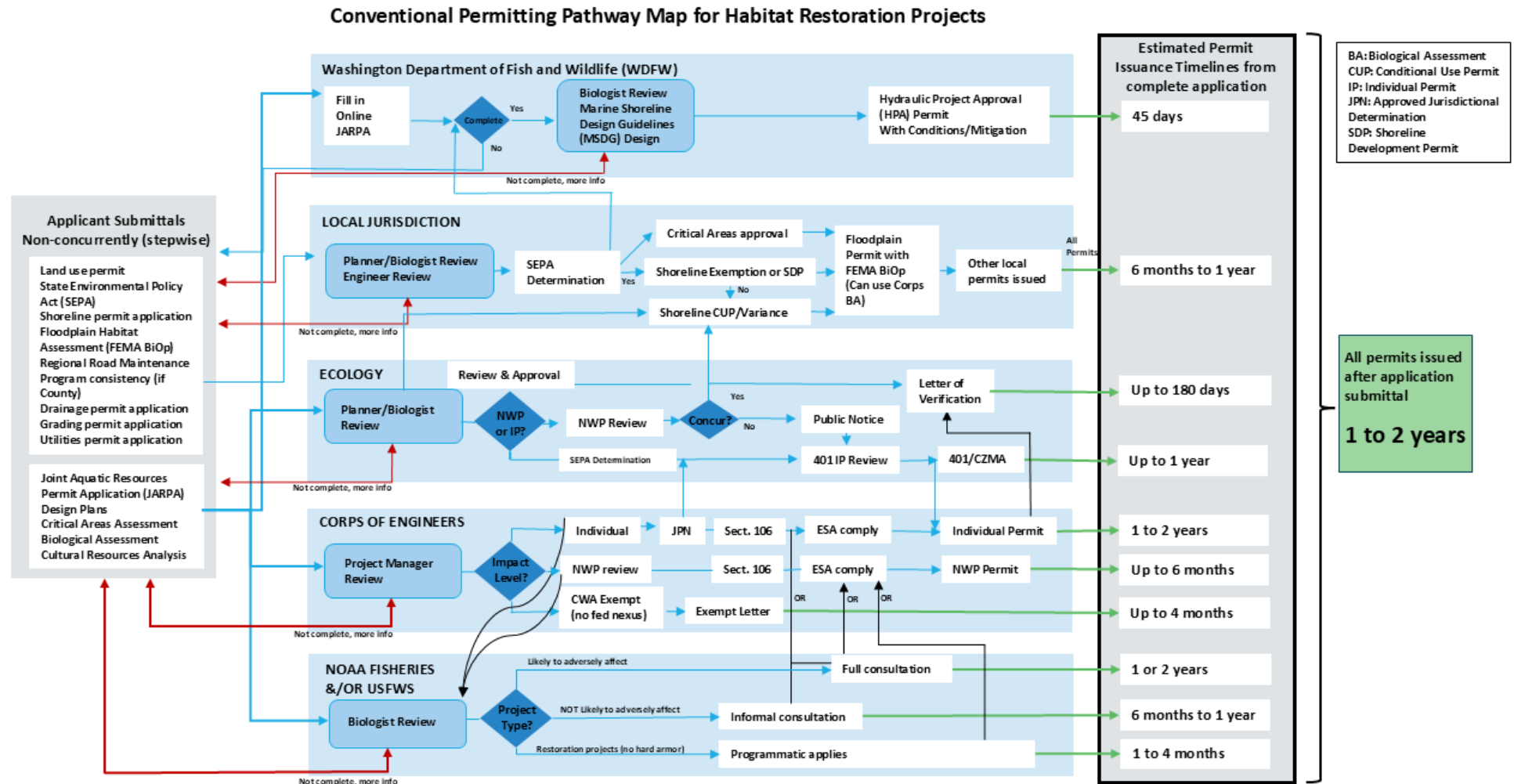


Figure 1. Example conventional permit process map. From adapted MART diagram (2024).

As shown in the permitting pathway map in Figure 2, MART and HRPP streamlined the permitting for NBS projects by creating early engagement with all agencies through a pre-application meeting, reducing redundant submittals, reducing the number of required permits, and using programmatic permits or consultations. The streamlining reduced the estimated timeline to receive all permits and authorizations from 1 to 2.5 years to 4 months to 1 year.

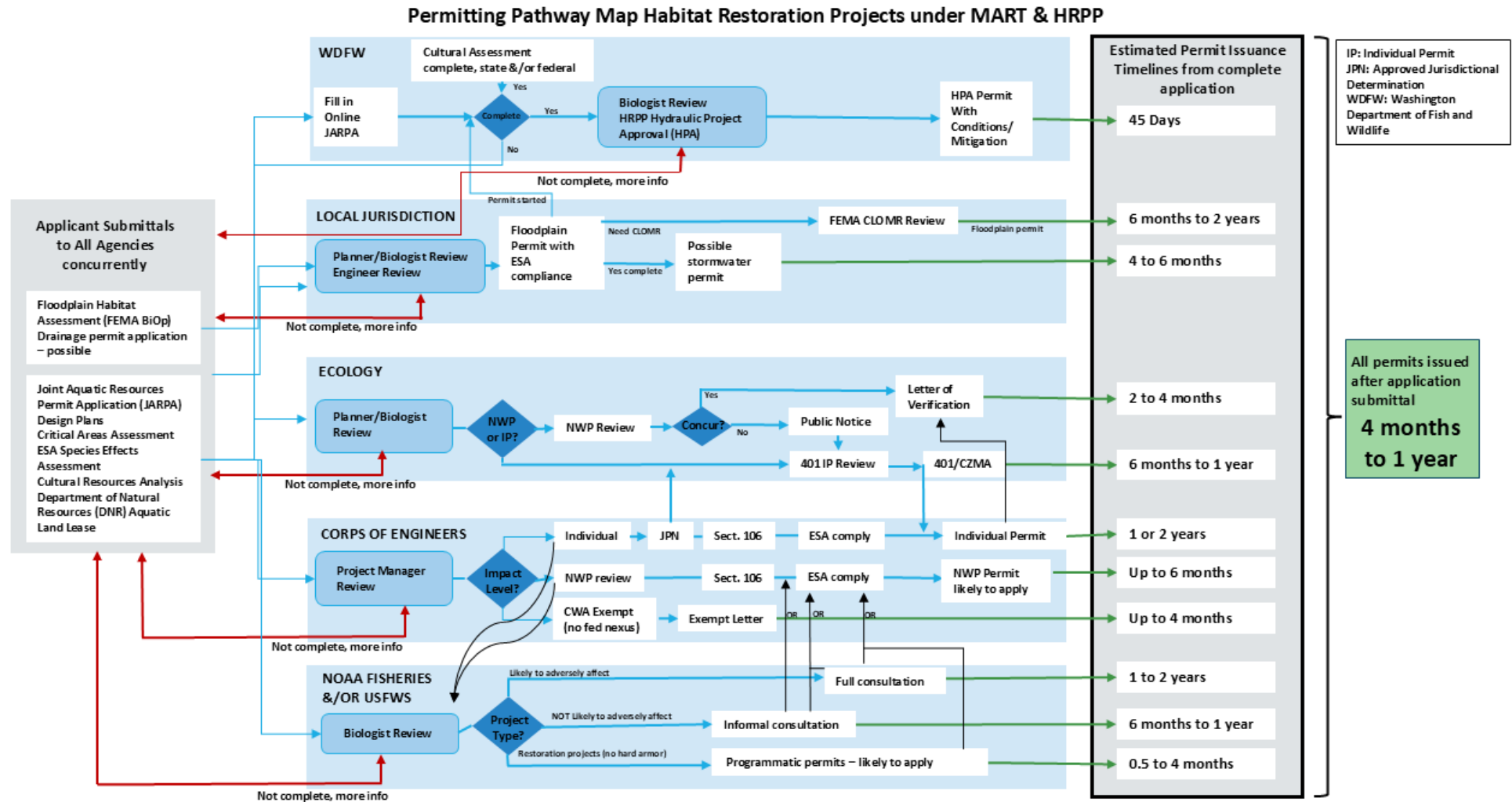


Figure 2. Example streamlined permit process map. From adapted MART diagram (2024).



MART also tracks applicants' progress and directs applicants to streamlined pathways for regulatory compliance. ESA compliance can often be complex and lengthy unless a project qualifies for a programmatic consultation instead of a consultation with NOAA Fisheries and USFWS. When USACE Seattle District is the lead federal permitting agency, one NOAA Fisheries programmatic consultation that can be used for a variety of NBS projects is the Fish Passage and Restoration Programmatic (FPRP III) consultation established in 2017 (USACE, 2024). FPRP III authorizes a variety of restoration activities in aquatic habitats that benefit fish and their habitat and increase ecosystem function, among other requirements. USACE also collaborates with USFWS on Fish Passage and Restoration Programmatic consultation that covers species for which USFWS is responsible. The USFWS Fish Passage and Restoration Programmatic covers many of the same NBS strategies covered under the NOAA Fisheries FPRP III. In Washington State, when federal agencies other than USACE are the lead permitting agency—such as FHWA—the USFWS and NOAA Fisheries may consult on a variety of NBS projects under their joint Programmatic Restoration Opinion for Joint Ecosystem Conservation by the Services, or PROJECTS (NOAA Fisheries & USFWS, 2020).



## Permitting and Environmental Review Case Studies

The case studies below showcase permitting and environmental reviews of four different NBS projects. They demonstrate the use of many of the best practices discussed above and how the permitting and approval process can vary greatly depending on the NBS strategy and project location.

### Beaver Restoration of Birch Creek

#### Project Background

In 2014, USFS, Utah State University, and a local rancher took on a project to restore Birch Creek in Preston, Idaho. The purpose of this project was to regenerate Birch Creek and restore downstream habitats and creek flow by reintroducing beavers into the watershed. Beaver dams naturally convert flooding liabilities into groundwater assets, which provide downstream flooding mitigation in wet months and longer periods of flow in drier months. Prior to this project, beaver populations in the area were being trapped and killed, causing local watershed degradation. This degradation impacted downstream water supplies needed for agriculture in local communities and aquatic habitats. The project involved closing beaver trapping and hunting in the Birch Creek drainage area to protect beaver populations and building beaver dam analogs on a section of the creek. Beaver dam analogs create a deeper water habitat to entice the beavers to stay in the area. The Birch Creek drainage area was closed to beaver trapping and hunting by the end of spring 2015, and all beaver dam analogs for this project were installed by 2016.

#### Environmental Authorizations and Permitting Required

This project was required to obtain stream alteration authorization from USACE and the Idaho Department of Water Resources. The proposed beaver dam analogs were located on USFS land, so a NEPA review was required. USFS determined the project qualified for a CE that allowed for restoring wetlands and streams by modifying water control structures. Pre-application activities, consultations, and application submittals took place from 2014 to 2015, and the project permits were issued in 2015.

#### Best Practices

USFS staff had a deep understanding of beaver co-benefits and used their good working relationships with the other regulators involved to communicate those benefits. Both USFS's and Utah State University's experience with beaver restoration also allowed them to justify utilizing a NEPA CE in a creative way to expedite the NEPA review timeline. Support from a local rancher involved in the project helped influence the permitting agencies toward a positive outcome. The rancher actively advocated for beavers to return to his ranch because he understood the environmental benefit they provide. Open communication and extensive knowledge of this NBS allowed the permitting process to be successfully completed within one year.

#### Project Success

Birch Creek now flows for over 40 days longer than in previous years without the beavers. Returning beavers to the creek enhanced fish habitat and biodiversity. Rare fish populations increased by over 1,000 percent because the beaver activity improved watershed health and created more wetland habitats needed by hundreds of different species as well as countless migratory birds and butterflies. Lastly, this project was estimated to cost 99 percent less than traditional stream restoration.

#### Project at a Glance

**NBS strategy:** Beaver Restoration

**Location:** Preston, Idaho

**Agencies:** USFS, USACE, Idaho Fish and Game, Idaho Department of Water Resources

#### Permitting Best Practices

- Creating open communication
- Increasing NBS knowledge
- Using NEPA Categorical Exclusions





# Mill River Watershed Urban Green Infrastructure

## Project Background

In fall 2018, Connecticut nonprofit Save the Sound began implementing two successful green infrastructure projects in the Mill River watershed. They partnered with a variety of other local organizations (Hamden Land Conservation Trust, Mill River Trail Advocates, Mill River Watershed Association, Urban Resources Initiative), municipalities (town of Hamden, city of New Haven), and the Yale School of Forestry and Environmental Studies to construct a bioretention facility in the town of Hamden and bioswales in the city of New Haven to protect the Mill River, an impaired water body, from stormwater pollution.

The first project involved a town park in Hamden that had no stormwater management and received a significant amount of piped stormwater. The lack of stormwater management caused flooding even during moderate rainfall events and the discharge of untreated stormwater into the Mill River. To solve these issues, a 2.5-acre bioretention facility was constructed to provide treatment, storage, and infiltration of the piped stormwater prior to discharge into Mill River. The second project was in the City of New Haven, which was also extremely susceptible to flooding during high-intensity, short-duration rainfall events. Part of New Haven experiences combined sewer overflows during wet weather, which causes bacteria pollution in the Mill River. To address these concerns, numerous bioswales were strategically installed in areas with flooding and stormwater pollution concerns. As of April 2024, 286 bioswales were installed in New Haven.

## Environmental Authorizations and Permitting Required

EPA awarded a Community Grant to Save the Sound to partially fund these projects. In this instance, projects receiving federal funding from an EPA Community Grant must undergo NEPA review. EPA determined that this project was eligible for a CE because it involved minor rehabilitation and replacement of an existing stormwater system. No federal permitting was required for this project, but the project was required to go through local stormwater program management review and approval.

## Best Practices

Using a CE streamlined the NEPA review timeline and allowed the projects to be completed quickly without a lengthy environmental review process.

## Project Success

These projects improved water quality in the Mill River watershed, provided green space for communities with environmental justice concerns, and improved public health. Volunteers from New Haven help maintain the newly installed bioswales, reducing maintenance costs. The bioretention facility in Hamden manages over 20 million gallons of stormwater annually.

## Project at a Glance

**NBS strategy:** Urban green infrastructure

**Location:** Hamden and New Haven, Connecticut

**Agencies:** EPA and local municipalities

**Permitting best practices:**  
Using NEPA Categorical Exclusions



*Photo Credit: Image provided by Dawn Henning, City of New Haven, Connecticut.*



# State Route 20 Skagit Riverbank Stabilization

## Project Background

In 2014, the Washington State Department of Transportation (WSDOT) partnered with FHWA in Skagit County, Washington, to protect a section of State Route 20 that passes through the Skagit River's floodplain. A river meander had begun to infringe on the highway right of way, spurring WSDOT to pursue a riverbank stabilization project spanning over 500 feet in length to both protect the highway and benefit fish habitat. The project installed a series of concrete dolos, jacks, and large woody materials designed to stabilize the bank and allow for revegetation.

## Environmental Authorizations and Permitting Required

This project was required to obtain a USACE CWA Section 404 individual permit due to the project exceeding the 500-foot threshold limit for the general permit NWP-13: Bank Stabilization. It also required ESA essential fish habitat consultation, an NHPA Section 106 consultation, and an FHWA Section 4(f) evaluation.

## Best Practices and Lessons Learned

The permitting agencies worked together as a team to review and coordinate on permit conditions. Open communication and coordination among agencies were important to the permit process for this project, which was viewed as an innovative NBS project at the time.

Several layers of the dolo-timber structures were intentionally designed by WSDOT as deformable, which meant the project footprint would naturally change over time. However, the CWA Section 404 permit language for this project treated these structures as static with a strict impact footprint, resulting in one dolo-timber that shifted location over time had to be removed from the river by WSDOT at high cost. This experience reveals an important lesson learned for permitting large NBS installations of this type, especially in areas with high or powerful flows. If permit language provided to the agency does not adequately reflect the adaptive nature of NBS design, costly fixes may occur in the future to maintain permit compliance.

## Project Success

Federal permitting staff expanded their knowledge base by supporting this effort and learning about the project's innovative design and multiple benefits. This project showcased that bank stabilization can be achieved with NBS techniques and that NBS may be as dynamic as the locations in which they are installed. Ten years later, WSDOT's design is still working as intended, and large natural woody material and vegetation has accumulated impressively at the site. The natural accumulation of woody material over time has proven to be very effective at lessening flows in a neighboring tide channel without completely cutting it off, protecting both the highway, an adjacent road, and adjacent fish habitats. WSDOT has monitored the site since the project was completed in 2014 and has found the installation has needed little maintenance. Biological monitoring shows that there has been no adverse effect on important fish spawning habitats in the area.

## Project at a Glance

**NBS strategy:** Riverbank stabilization

**Location:** Skagit County, Washington

**Agencies:** FHWA, NOAA Fisheries, USACE, USFWS, and WSDOT

**Permitting best practices:** Creating open communication



*Photo Credit: Image provided by Washington State Department of Transit*

# Windy Hill Living Shoreline

## Project Background

In 2010, the Maryland Department of Natural Resources (DNR), in coordination with the Delmarva Resources Conservation and Development Council and Underwood & Associates, restored a stretch of eroding shoreline along the Corsica River in Centreville, Maryland. At the time of its construction, the project was one of Maryland's most innovative shoreline restorations. Prior to restoration, the site had a failing wooden bulkhead, and stormwater flowed into the river with no stabilized banks, which resulted in excessive sediment discharges. The erosion was also threatening residential properties along the shoreline. Maryland DNR took advantage of this opportunity to implement a unique design that included a crescent shoreform instead of straightening the shoreline, used smooth cobblestones instead of typical large angular rocks, incorporated woody debris from trees that were removed during construction to enhance the shallow water habitat, seeded the tombolos with native seeds, and included green infrastructure upstream to slow runoff before it reached the shoreline.

## Environmental Authorizations and Permitting Required

The project was authorized by USACE under the USACE Maryland State Programmatic General Permit-6. The Maryland Department of the Environment also authorized the project through a joint permit application with USACE, and NOAA Fisheries conducted an ESA consultation. Monitoring, which can add additional complexity and expenses, was funded through an agreement with NOAA Fisheries and the Virginia Institute of Marine Science. The consultation and permit application process ran from winter 2008 to summer 2009, and final approvals and permits were issued in spring 2010.

## Best Practices

Before beginning application and consultation activities, the project team held multiple meetings in winter 2008 with the relevant federal, state, and local agencies. The project designer participated in these meetings, which created open dialogue with regulatory agencies and allowed the project team to incorporate input from the regulators into the project's design. For example, NOAA Fisheries was concerned with the proposed amount of encroachment of the proposed living shoreline into the channel because they wanted to protect against filling of open water. The project team presented NOAA Fisheries with scientific literature and other project examples supporting the proposed design. Ultimately, NOAA Fisheries approved the project based on the scientific evidence provided. The project team ensured reviewers were informed of why projects decisions were made by maintaining open lines of communication.

## Project Success

The project was successful largely due to pre-application activities and the partnership between the regulatory agencies and the project leads. The design was innovative at the time, and its success helped reshape the language of the USACE Maryland State Programmatic General Permit-6 special conditions, which now include language about incorporating woody debris into living shoreline designs.

## Project at a Glance

**NBS strategy:** Living shoreline

**Location:** Centreville, Maryland

**Agencies:** USACE, NOAA Fisheries and Maryland Department of the Environment

### Permitting best practices:

- Creating open communication
- Increasing NBS knowledge



## Appendix A: NBS Permits, Reviews, Authorizations, and Consultations

The information in this appendix can be used to better understand the specific environmental permits and authorizations a project may be required to obtain and the consultations and reviews a project may be subject to in order to make the permitting and approval process more efficient. It also describes the important pre-application steps of a pre-application meeting and community outreach. The following is not an all-inclusive list of federal authorities that may apply to an NBS project. Applicants should coordinate with federal agencies for project specific federal permitting requirements, as well as coordinate with state and local authorities for other permitting needs.

### 1. PRE-APPLICATION

**Interagency Pre-Application Meeting** – Pre-application coordination between applicants and agencies is strongly encouraged. Benefits of pre-application meetings include improved communication, better quality of applications, reduced duplication of efforts, and an open line of communication during the review process. All these items can result in a more streamlined and efficient permitting process.

**Community Outreach, Coordination, and Planning** – Coordination with the community is also a crucial step depending on project location and its impacts to the community.

### 2. PERMITS/AUTHORIZATIONS

| Agency  | Statute/Authority  | Potential Permits/Authorizations   | Application Form(s)/Process  | Notes  |
|---|--|--|--|--|
| U.S. Environmental Protection Agency (EPA) / Authorized State, Territory or Tribe | Clean Water Act (CWA) - Section 401  | Water Quality Certification  | Varies by Authorized State, Territory or Tribe / EPA<br><a href="#">CWA - Section 401</a>  | Under Section 401 of CWA, a federal agency may not issue a license or permit to conduct any activity that may result in any discharge into waters of the U.S. unless the authorized tribe or state where the discharge originates either issues a Section 401 water quality certification or waives certification. |
| EPA / Authorized State, Territory, or Tribe                                       | CWA - Section 402 (National Pollutant Discharge Elimination System Permit Program) | 1. Construction General Permit (CGP)<br>2. Section 402 Individual Permit | <a href="#">CWA - Section 402</a> (National Pollutant Discharge Elimination System)<br><a href="#">EPA CGP application process</a> | For land disturbance of at least one acre or part of a common plan of development of at least one acre.  |



## 2. PERMITS/AUTHORIZATIONS

| Agency  | Statute/Authority  | Potential Permits/Authorizations  | Application Form(s)/Process  | Notes   |
|---|--|---|--|---|
| EPA   | Marine Protection Research & Sanctuaries Act (MPRSA)                         | MPRSA permit – Section 102 (All materials, other than dredged material) | <a href="#">MPRSA Permits</a>  | MPRSA regulates disposition and transportation of material in the ocean, subject to limited exceptions. EPA issues permits for all materials other than dredged material.   |
| Federal Emergency Management Agency (FEMA)                            | <a href="#">FEMA - Floodplain Standards National Flood Insurance Program</a> | Development permit  | <a href="#">FEMA Permit for Floodplain Development</a>   | A permit is required before construction or development begins within any Special Flood Hazard Area.  |
| National Oceanic and Atmospheric Administration (NOAA) / State Agency | Coastal Zone Management Act  | <a href="#">Federal Coastal Consistency Determination</a>               | Each state has a federal consistency list which identifies the federal agency, federal license or permit, and federal financial assistance activities that are subject to federal consistency review. Federal consistency lists vary by state; see <a href="https://coast.noaa.gov/czm/consistency/states/">https://coast.noaa.gov/czm/consistency/states/</a> for more details. | Under the CZMA, a state may review: activities conducted by, or on behalf of, a federal government agency within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone; an application for a federal license or permit; and any plan for the exploration or development, or production from, any area that has been leased under the Outer Continental Shelf Lands Act for offshore minerals exploration or development. The CZMA requires federal agency activities to be consistent to the maximum extent practicable with the enforceable policies of a state's approved coastal zone management program. |

## 2. PERMITS/AUTHORIZATIONS

| Agency  | Statute/Authority  | Potential Permits/Authorizations  | Application Form(s)/Process   | Notes  |
|---|--|---|---|--|
| United States Army Corps of Engineers (USACE) | <p><b>CWA - Section 404</b> - Discharge of dredged or fill material into Waters of the US</p> <p><b>River and Harbors Act of 1899 - Section 10</b> - Work or Structures, In, On, Over or Under Navigable Waters of the US</p> <p><b>MPRSA - Section 103</b> - USACE and EPA share regulatory responsibility for disposal of dredged material and USACE issues the permits.</p> | <ol style="list-style-type: none"> <li>General permits/Pre-Construction Notification - includes Nationwide Permits (NWP), Regional General Permit (RGP) and Programmatic General Permit (PGP)               <ol style="list-style-type: none"> <li>Pertinent examples of NWPs include, but are not limited to:                   <ul style="list-style-type: none"> <li>NWP 13 (10/404) - Bank Stabilization</li> <li>NWP 27 (10/404) - Aquatic Habitat, Restoration, Enhancement, and Establishment Activities</li> <li>NWP 43 (404) - Stormwater Management Facilities</li> <li>NWP 54 (10/404) - Living Shorelines</li> <li>NWP 59 (404) - Water Reclamation and Reuse Facilities</li> <li>RGP</li> </ul> </li> </ol> </li> <li>Individual Permit (includes Standard Permits and Letters of Permission)</li> </ol> | <p>Application Portal: <a href="https://armymil.usace.army.mil/regulatory-request-system/">Regulatory Request System (army.mil)</a></p> | <p><a href="https://www.usace.army.mil/regulatory-program/">USACE Regulatory Program Website</a></p> <p><a href="https://www.usace.army.mil/regulatory-program/information-on-how-to-obtain-an-usace-permit/">Information on how to obtain an USACE permit (army.mil)</a></p> <p><a href="https://www.usace.army.mil/regulatory-program/summary-table-of-2021-final-nationwide-permits/">Summary Table of 2021 Final Nationwide Permits (oclc.org)</a></p> |

### 3. FEDERAL CONSULTATIONS AND REVIEWS

| Agency  | Statute/Authority  | Available Consultations/<br>Reviews  | Consultant Process   | Notes   |
|---|--|--|--|---|
| Lead Federal Agency                           | National Environmental Policy Act (NEPA)                 | <ol style="list-style-type: none"> <li>1. Categorical Exclusion (CE) Determination</li> <li>2. Environmental Assessment (EA) and Finding Of No Significant Impact (FONSI)</li> <li>3. Environmental Impact Statement (EIS) and Record of Decision (ROD)</li> </ol> | <a href="#">NEPA Review Process</a>  | NEPA requires federal agencies to assess the environmental effects of their proposed actions, and coordinate with other government agencies prior to making decisions. NEPA is triggered by a range of federal actions including funding and permit decision-making.  |
| NOAA  | Magnuson-Stevens Fishery Conservation and Management Act | Federal agencies must consult with NOAA National Marine Fisheries Service (NOAA Fisheries) when activities they undertake or permit have the potential to adversely affect essential fish habitat (EFH).   | <a href="#">Consultations for EFH   NOAA Fisheries</a>   | EFH consultation is required when:<br>1) a federal action has funded, authorized, or undertaken all or part of a proposed action and 2) The action will “adversely” affect EFH. An adverse effect includes direct or indirect physical, chemical, or biological alterations.  |
| NOAA / U.S. Fish and Wildlife Service (USFWS) | Endangered Species Act - Section 7                       | Federal agencies must consult with NOAA Fisheries, USFWS or both, before taking any action that may affect an endangered or threatened species or their critical habitat.  | <b>Informal Consultation:</b><br>Request for Concurrence<br><br><b>Formal Consultation:</b><br>Biological Assessment<br><a href="#">USFWS-Section 7 Consultation for ESA</a><br><a href="#">NOAA Fisheries Section 7 Consultation for ESA</a><br><a href="#">Information for Planning and Consultation</a> | Consultation for federal permitting/authorizations, funding, carrying out activities (i.e., federal actions), to provide exemptions to the Section 9 take prohibitions of the ESA (if necessary, formal consultation)<br><br>“Federal actions” are those that are funded, authorized, or carried out by a federal agency. |

### 3. FEDERAL CONSULTATIONS AND REVIEWS

| Agency  | Statute/Authority   | Available Consultations/<br>Reviews   | Consultant Process  | Notes   |
|---|---|---|---|---|
| NOAA /<br>USFWS   | Fish and Wildlife<br>Coordination Act                                   | Any federal agency issuing permits must consult with USFWS and NOAA Fisheries if the proposed activities could potentially harm fish and/or wildlife resources.   | <a href="#">Wildlife Coordination Act Consultation</a><br><a href="#">Habitat Consultations</a> | These consultations may result in project modification and/or the incorporation of measures to reduce these effects.  |
| State Historic<br>Preservation<br>Officer<br>(SHPO) /<br>Tribal Historic<br>Preservation<br>Officer<br>(THPO) | <a href="#">National Historic Preservation Act (NHPA) - Section 106</a> | Any federal agency issuing a permit to account for potential effects of the proposed activity on historic properties (e.g., shipwrecks, prehistoric sites, cultural resources) must consult with the SHPO and/or THPO (as well as local governments and other interested stakeholders). | Varies by Authorized State, Territory or Tribe  | <a href="#">NHPA - Section 106</a> review requires the federal agency, before issuing a license (permit), to identify areas of potential effect, adopt measures—when feasible—to mitigate potential adverse effects of the licensed activity and properties listed or eligible for listing in the National Register of Historic Places. |
| USFWS   | Coastal Barrier<br>Resources Act  | Federal agencies must consult with USFWS before making federal expenditures and financial assistance available within System Units pursuant to statutory exceptions in certain relatively undeveloped coastal areas.  | <a href="#">Coastal Barrier Resources Act Consultation</a>                                      | <a href="#">Coastal Barrier Resources Act Consultations Flow Chart</a>  |



## **Appendix B: NBS Resources and Guidance**

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[Building Community Resilience with Nature-Based Solutions: A Guide for Local Officials](#), FEMA

[Building Community Resilience with Nature-Based Solutions, Strategies for Success](#), FEMA

[Department of the Interior Nature-Based Solutions Roadmap](#), Department of the Interior

[2024 Efficient Permitting Roadmap, A guide to the regulatory process for sediment management on the North-central California Coast](#), North-Central California Coastal Sediment Coordination Committee

[Engineering with Nature, an Atlas](#), USACE

[Engineering with Nature Program webpage](#), USACE

[Funding Nature Not Paperwork, Policy and Programmatic Pathways to Speed Restoration Permitting](#), Environmental Policy Innovation Center

[Incorporation of Nature-Based Solutions in Civil Works Projects Memorandum](#), USACE

[Green Infrastructure Federal Collaborative webpage](#), EPA

[Nature-Based Solutions webpage](#), FEMA

[Nature-Based Solutions Resource Guide, compendium of federal examples, guidance, resource documents, tools, and technical assistance](#), White House Council on Environmental Quality, White House Office of Domestic Climate Policy, White House Office of Science and Technology Policy

[Opportunities to Accelerate Nature-Based Solutions: A Roadmap for Climate Progress, Thriving Nature Equity, & Prosperity](#), White House Council on Environmental Quality, White House Office of Domestic Climate Policy, White House Office of Science and Technology Policy

[Pay for Success and Streamlined Permitting Database](#), Environmental Policy Innovation Center

[Permitting Dashboard \(performance.gov\)](#), Permitting Council /FAST-41 Resources

[2024 Resilience Project Funding Guide](#), Department of Defense Readiness And Environmental Protection Integration Program

## References

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- FEMA. (2021). *Guidance for flood risk analysis and mapping floodway analysis and mapping*. [https://www.fema.gov/sites/default/files/documents/fema\\_floodway-analysis-mapping\\_112021.pdf](https://www.fema.gov/sites/default/files/documents/fema_floodway-analysis-mapping_112021.pdf)
- Goodrich, K. A., Ulibarri, N., Matthew, R., Stein, E. D., Brand, M., & Sanders, B. F. (2023). Toward improved sediment management and coastal resilience through efficient permitting in California. *Environmental Management*, 72(3), 558–567. <https://doi.org/10.1007/s00267-023-01804-1>
- Gregory, A., Lopes, J., Powell, K., & Altman, S. (2024). *Beneficial use of dredged material in the Atlantic Intracoastal Waterway: Approaching the regulatory process*. USACE Engineer Research and Development Center. <https://erdc-library.erdc.dren.mil/items/b1426a6b-8fd4-45ad-9dcf-d669c89e61d0>
- Howarth, M., & Berkowitz, J. (2024). *Perspectives on permitting and environmental review of nature-based solutions*. World Environmental & Water Resources Congress 2024. <https://ascelibrary.org/doi/10.1061/9780784485477.035>
- ICUN. (2020). *IUCN Global Standard for Nature-Based Solutions: A user-friendly framework for the verification, design and scaling up of NBS: First edition*. <https://doi.org/10.2305/IUCN.CH.2020.08.en>
- NOAA Fisheries & USFWS. (2020). *Projects contractors handbook*. <https://www.fws.gov/sites/default/files/documents/2020.11.19%20Contractor%20Handbook%20REVISED%20Ver1.2.pdf>
- Permitting Council. (2021). *Federal environmental review and authorization inventory*. Permitting Dashboard Federal Infrastructure Projects. <https://www.permits.performance.gov/tools/federal-environmental-review-and-authorization-inventory>
- USACE. (2024). *Electronic permit guidebook: Endangered species*. US Army Corps of Engineers. <https://www.nws.usace.army.mil/Missions/Civil-Works/Regulatory/Permit-Guidebook/Endangered-Species/>
- Warnell, K., Mason, S., Siegle, A. Merritt, M. & Olander, L. (2023). *Department of the Interior nature-based solutions roadmap* (NI R 23-06). Nicholas Institute for Energy, Environment & Sustainability, Duke University, and U.S. Department of the Interior. <https://www.nicholasinstitute.duke.edu/publications/department-interior-nature-based-solutions-roadmap>
- White House Council on Environmental Quality (CEQa). (2022). *Memorandum for heads of federal departments and agencies: Guidance for federal departments and agencies on indigenous knowledge*. <https://www.whitehouse.gov/wp-content/uploads/2022/12/OSTP-CEQ-IK-Guidance.pdf>
- White House Council on Environmental Quality (CEQb), White House Office of Science and Technology Policy, White House Domestic Climate Policy Office. (2022). *Opportunities for accelerating nature-based solutions: A roadmap for climate progress, thriving nature, equity, & prosperity*. Report to the National Climate Task Force. <https://www.whitehouse.gov/wp-content/uploads/2022/11/Nature-Based-Solutions-Roadmap.pdf>