

PACIFIC NORTHWEST SITE OFFICE
CULTURAL AND BIOLOGICAL RESOURCES
MANAGEMENT PLAN

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Summary

The U.S. Department of Energy (DOE) Pacific Northwest Site Office (PNSO) has prepared the PNSO Cultural and Biological Resources Management Plan (CBRMP) in response to the direction and guidance provided in DOE Policy 141.1, “Department of Energy Management of Cultural Resources,” and guidance in DOE Order 430.1b “Real Property and Asset Management” relative to protecting and sustaining cultural and biological resources on federal lands and facilities. This management plan provides the direction and management strategy to meet PNSO’s stewardship and management responsibilities for the biological and cultural resources on the Pacific Northwest National Laboratory (PNNL) Site located in Richland, Washington, which includes approximately 141 ha (348 acres) of developed and undeveloped lands adjacent to the Columbia River. The purpose of the CBRMP is to provide direction and consideration of the protection and long-term stewardship of cultural and biological resources on PNSO-managed land in accordance with federal and state laws, and assure compliance with applicable laws for all PNNL-related research projects and facility maintenance and operation activities.

This CBRMP describes the goals, methods, and process to be used by PNSO in managing cultural and biological resources on the PNNL Site. In addition to directing the implementation of management strategies and administration related to resources on PNSO lands, the CBRMP will help assure that all of the research activities under PNSO oversight and federally funded PNNL facility maintenance actions are in compliance with the federal laws, Executive Orders, and DOE Orders described in Appendix A

The management approach in PNSO’s CBRMP also enables the DOE Office of Science to comply with Washington State regulations regarding fish and wildlife management, shoreline management, and noxious weed control.

This management plan describes the biological and cultural resources of PNSO-managed lands in an ecoregional and historic context, and defines the roles and responsibilities of program participants, the regulatory drivers, the types of activities that require cultural and biological resource considerations, and PNSO’s approach to identifying and managing impacts on biological and cultural resources.

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Abbreviations and Acronyms

ac	acre(s)
ACHP	Advisory Council on Historic Preservation
AHPA	<i>Archaeological and Historic Preservation Act of 1974</i>
ARPA	<i>Archaeological Resources Protection Act of 1979</i>
BRR	Biological Resources Review
CBRMP	Cultural and Biological Resources Management Plan
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
CFR	<i>Code of Federal Regulations</i>
cm	centimeter(s)
CRR	Cultural Resources Review
CWA	<i>Clean Water Act</i>
DAHP	Washington State Department of Archaeology and Historic Preservation
DOE	U.S. Department of Energy
EFH	essential fish habitat
EMSL	William R. Wiley Environmental Molecular Science Laboratory
ESA	<i>Endangered Species Act of 1973</i>
ft	foot (feet)
GIS	geographic information system
ha	hectare(s)
HSA	<i>Historic Sites Act of 1935, as amended</i>
in.	inch(es)
MBTA	<i>Migratory Bird Treaty Act of 1918</i>
MOA	Memorandum of Agreement
NAGPRA	<i>Native American Graves Protection and Repatriation Act</i>
NEPA	<i>National Environmental Policy Act of 1969</i>
NHPA	<i>National Historic Preservation Act of 1966</i>
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places

PNNL	Pacific Northwest National Laboratory
PNSO	(DOE) Pacific Northwest Site Office
PSF	Physical Sciences Facility
RCW	Revised Code of Washington
RL	(DOE) Richland Operations Office
SHPO	State Historic Preservation Officer (or Office)
SME	subject matter expert
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WISAARD	Washington Information System for Architectural and Archaeological Records Data

Glossary

Advisory Council on Historic Preservation (ACHP)	An independent federal agency responsible for administering the protective provisions of the <i>National Historic Preservation Act of 1966</i> (NHPA). The Advisory Council is responsible for reviewing the historic preservation policies and programs of all federal agencies and recommending methods for improving the effectiveness, coordination, and consistency of those policies and programs in accordance with the intent of the NHPA.
biological resource	A biological species, population, species assemblage, habitat, community, or ecosystem.
biotic	Associated with or derived from living organisms.
building	A structure created to shelter any form of human activity such as a house, barn, church, hotel, or similar structure. May refer to a historically related complex such as a courthouse and jail or a house and barn (36 CFR Part 60).
categorical exclusion	A category of actions as defined in the DOE <i>National Environmental Policy Act of 1969</i> (NEPA) implementing procedures (10 CFR Part 1021) for which neither an environmental assessment nor an environmental impact statement typically is required.
community	An association or assemblage of interacting plant and animal populations that live in a particular area or habitat.
consultation	The process of seeking, discussing, and considering the views of other participants in good faith in arriving at solutions and alternatives.
cultural resources	A collective term applicable to 1) prehistoric and historic archaeological sites and artifacts designating past Native American use of the PNNL Site; 2) historic archaeological sites and artifacts indicating early settler activities relating to the pre-Hanford period; 3) Manhattan Project and Cold War era buildings, structures, and artifacts; 4) landscapes, sites, plants and animals of cultural value to the Native American community; and 5) landscapes, sites, and materials of traditional cultural value to non-Native Americans.
cultural/biological resource review	A review of proposed project locations to consider potential project impacts on cultural resources, historic properties, habitats, and native plants and animals.
district	A geographically definable area, urban or rural, that possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united by past events or aesthetically by plan or physical development. A district may also comprise individual elements separated geographically but linked by association or history (36 CFR Part 60).

ecoregion	A continuous geographic area in which the environmental complex, produced by climate, topography, and soil, is sufficiently uniform to develop characteristic potential major vegetative communities.
ecosystem	A complete interacting system of organisms and their environment, or a naturally occurring, self-maintaining system of biotic and abiotic interacting parts that are self-organized into biophysical and social components and are linked to each other by exchanges of energy, matter, and information.
ecosystem services	The important benefits for human beings that arise from healthily functioning ecosystems, such as production of oxygen, soil genesis, climate regulation, pollination, and medicines.
endangered species	Any species in danger of extinction throughout all or a significant portion of its range.
ethnohistoric and ethnographic period	Refers to the period of time associated with Native American land use and life ways after Euro-American contact and settlement in the area up to the present. Includes traditional, historic, and cultural activity that is associated with the recent past up to the present and is held in the minds, memories, and customs of people who live in an area.
habitat	The combination of biotic and abiotic components that provides the ecological support system for plant or animal populations.
historic context	An organization format that groups historic properties that share similarities of time, theme, and geography. Historic contexts are linked to actual resources and used by public and private agencies and organizations to develop management plans based upon actual resource needs and information.
historic preservation	Identification, evaluation, recordation, documentation, curation, acquisition, protection, management, rehabilitation, restoration, stabilization, maintenance, research, interpretation, conservation, education, and training related to the preservation of historic properties owned or controlled by federal agencies (<i>National Historic Preservation Act of 1966, Section 110</i>).
historic property	Any pre-contact or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains related to and located within such properties. <i>Eligible for inclusion in the National Register</i> includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet National Register listing criteria (36 CFR Part 60).
interested person, party, or stakeholder	Those organizations and individuals concerned with the effects of an undertaking on historic properties.

inventory	The process of collecting initial information concerning the occurrence and status of specific biological resources.
Memorandum of Agreement	The document that records the terms and conditions agreed upon to resolve the adverse effects of an undertaking upon historic properties (36 CFR Part 800).
mitigation	A series of prioritized actions that, when achieved in full, assures project impacts will result in no net loss of habitat value or wildlife populations. The sequence of mitigation actions proceeds from the highest to lowest priority as follows: 1) avoid the impact altogether, 2) minimize the impact, 3) rectify the impact by restoring the affected environment, and 4) compensate for the impact by replacing or providing substitute resources or environments.
monitoring	The process of collecting information to evaluate whether objective and anticipated or assumed results of a management plan are being realized or whether implementation is proceeding as planned. Specifically for mitigation: the collection of specific types of data to determine if the goals and objectives of project-specific mitigation or the mitigation bank are met.
National Register of Historic Places	Maintained by the Secretary of the Interior, the list includes districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture established under Section 101 of the NHPA.
native species	A species that occurs naturally within a region, evolving there without human assistance through natural processes and persists without human manipulation or intervention.
non-native species	A species occurring in an area outside of its historically known natural range as a result of intentional or accidental dispersal by human activities. Non-native species also may be known as alien, introduced, or exotic species.
PNNL Site	Approximately 141 ha (348 ac) of Federally owned land, reserved for PNNL use, located partly in Richland, Washington but wholly in Benton County, Washington, and in proximity to the Hanford Site 300 Area to the north and west and Battelle-owned land to the south.
pre-contact period	Time period before European contact in the Americas. In the Columbia Plateau, this dates to the early 1800s when Lewis and Clark travelled through the area and more intensively after the 1850.
priority habitat	A habitat designated by the Washington Department of Fish and Wildlife as having unique or significant value to many wildlife species. A priority habitat may be described by a unique vegetation type, dominant plant species of primary importance to fish and wildlife, successional stage, or specific habitat element (e.g., talus slopes) of key value to fish and wildlife.

protection	“The act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property” (“The Secretary of Interior’s Standards for the Treatment of Historic Properties” [36 CFR Part 68]).
riparian	The transition zone between aquatic (specifically flowing water) and terrestrial ecosystems, within which plants are dependent on a perpetual source of water.
sensitive species (state)	A species native to the state of Washington that is vulnerable or declining and likely to become endangered or threatened without active management or the removal of threats.
shrub-steppe	Plant communities consisting of one or more layers of perennial bunchgrasses with a conspicuous but discontinuous layer of shrubs.
site	The location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself maintains historical or archaeological value regardless of the value of any existing structure (36 CFR Part 60).
Site Preservation Officer	The DOE individual responsible for managing the DOE historic preservation program and coordinating all preservation activities for DOE.
species of concern	A species targeted for review and consideration in biological resource reviews. Typically includes federal or state endangered, threatened, proposed, or candidate species; plus any additional species identified by the Washington Department of Fish and Wildlife as a priority species. U.S. Fish and Wildlife Service Offices often maintain a separate list of species of concern that are of management concern in that region, but are not currently listed or expected to be listed as endangered or threatened species.
State Historic Preservation Officer (SHPO)	The official appointed or designated pursuant to Section 101(b)(1) of the <i>National Historic Preservation Act of 1966</i> to administer the State Historic Preservation Program, or a representative designated to act for the State Historic Preservation Officer (36 CFR Part 800).
stewardship	The act of making decisions, performing activities, taking actions, and fulfilling responsibilities and/or agreements associated with being a proactive caretaker or custodian. <i>Stewardship responsibility</i> implies that duties will be executed in an ethical, socially acceptable, and legal manner.
threatened species	Any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Tribe	An Indian band, nation, or other Native American group or community that attaches religious or cultural importance to the area of the PNNL Site. Tribes that have identified such an attachment include the Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Colville Reservation, the Wanapum, and the Yakama Nation.
undertaking	A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; those requiring a federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency. Undertakings include new and continuing projects, activities, or programs and any of their elements not previously considered under NHPA Section 106 (36 CFR Part 800).
wetlands	Areas that under typical circumstances have hydrophytic vegetation, hydric soils, and wetland hydrology.

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1.0 Introduction

The U.S. Department of Energy (DOE) Pacific Northwest Site Office (PNSO) was created in 2003 to oversee and manage the DOE contract for the Pacific Northwest National Laboratory (PNNL). PNSO is responsible for program implementation, acquisition management, and overall stewardship of PNNL. PNSO must assure that all PNNL-related activities comply with applicable laws, policies, and DOE directives. PNSO is responsible for developing and maintaining the policies and directives for conserving and preserving the natural and cultural resources on departmental lands while sustaining assigned mission activities (DOE O 436.1). In meeting this responsibility PNSO developed this integrated Cultural and Biological Resource Management Plan (CBRMP), which incorporates mission, ecological, and cultural factors. PNSO and its contractors use this plan to meet stewardship responsibilities for departmental lands and facilities, while maintaining compliance with applicable federal and state regulations, Executive and DOE Orders and Directives, and treaties.

PNNL delivers breakthrough science and technology in the areas of chemical and molecular science, climate change science, biological systems science, environmental subsurface science, advanced computer science, visualization and data analysis, applied nuclear science and technology, applied materials science and engineering, chemical engineering, energy and environment, systems engineering and integration, and national security. One of 10 National Laboratories overseen by the DOE Office of Science, PNNL is operated under contract by Battelle Memorial Institute (Battelle).

1.1 CBRMP Purpose and Scope

DOE land and facilities are considered valuable national resources, and DOE Orders direct that land-use planning and stewardship responsibilities are implemented in a manner consistent with the principles of ecosystem management and sustainable development (DOE O 430.1b [9-24-03]). The purpose of the PNSO CBRMP is to identify the management strategies and actions that are taken to assure 1) that important cultural and biological resources under PNSO stewardship are protected and 2) that all PNNL operations as well as all research activities conducted by PNNL comply with applicable environmental, biological, and cultural regulations and laws. The CBRMP was prepared to meet the requirements of DOE Policy 141.1, “Department of Energy Management of Cultural Resources” and to follow the direction relative to biological and cultural resources within DOE Orders 436.1 “Departmental Sustainability” and 430.1b “Real Property and Asset Management.”

PNSO understands the importance of the biological and cultural resources to all stakeholders and manages these resources accordingly. Specific objectives of the CBRMP include the following:

- Provide for protection and management of cultural and biological resources under PNSO stewardship consistent with DOE policy and as required by applicable state and federal statutes, regulations, and Orders.
- Integrate resource management goals and administrative procedures into relevant program- and project-level planning and activities to assure that potential adverse impacts on resources are avoided or minimized.
- Provide information about the status of biological and cultural resources on the PNNL Site and describe the methods and actions taken to protect the integrity of the resources and comply with regulatory requirements.

- Identify actions taken to make sure that the resources on departmental lands will be protected from impacts by unauthorized public use.

1.2 Scope of the Cultural and Biological Resource Management Plan

PNSO's stewardship responsibility includes the management of resources associated with PNSO federal facilities and lands. In addition, PNSO must consider the potential impacts of PNNL research activities and federally funded facilities operations and maintenance actions conducted on the PNNL Site and at other locations. The CBRMP provides management guidance for PNSO federal facilities and land that constitutes the PNNL Site in Richland, Washington. The PNNL Site is located in Benton County in southeastern Washington State—275 km (171 mi) east-northeast of Portland, Oregon, 270 km (168 mi) southeast of Seattle, Washington, and 200 km (124 mi) southwest of Spokane, Washington. It is located at the northern boundary of the city of Richland and south of the DOE-Richland Operations Office's (DOE-RL's) Hanford Site 300 Area (Figure 1.1). The site is bounded to the west by Stevens Drive, and on the east by the Columbia River. The PNSO federally owned footprint is comprised of 141ha (348ac) north of Horn Rapids Road as well as the William R. Wiley Environmental Molecular Sciences Laboratory (EMSL) located south of Horn Rapids Road.

Direct management of biological and cultural resources (for instance, weed control or archaeological site monitoring) is part of PNSO's stewardship responsibility for PNSO-owned land that constitutes the PNNL Site. These management responsibilities are not extended to other sites or facilities. Activities are also conducted at other government facilities and at private facilities in Richland, Sequim, Seattle, North Bonneville, Washington, Portland, Oregon, and other locations throughout the United States and the world. PNSO is responsible for maintaining compliance with applicable federal and state regulations, Executive and DOE Orders and Directives, and treaties at all locations where these activities occur. The regulatory compliance procedures described in Sections 4 and 5 of this CBRMP are applicable at all locations where these activities occur, including all federal and non-federally owned sites.

1.3 Plan Organization

The ensuing sections of the plan describe the environmental setting of the PNNL Site, as well as the biological and cultural management and compliance goals and procedures implemented by PNSO:

- Section 2 describes the goals of the management plan.
- Section 3 provides an overview of the PNNL Site environmental setting, known cultural resources, and their cultural and historic context, and known biological resources, as well as their ecological context within Washington's Columbia Plateau Ecoregion.
- Section 4 outlines the process used to assure cultural resource compliance for all PNNL related actions and the management of cultural resources on the PNNL Site, such as maintenance and monitoring for long-term protection of important resources, to meet PNSO's stewardship obligations.
- Section 5 outlines the process that PNSO follows to assure that PNNL is compliant with applicable biological resource protection laws, regulations, and Orders and the specific management actions performed on the PNNL Site to meet PNSO's biological resource stewardship obligations.
- References cited are listed in Section 6.
- Appendix A provides a summary of the applicable guidance and legal requirements governing the protection of cultural and biological resources.

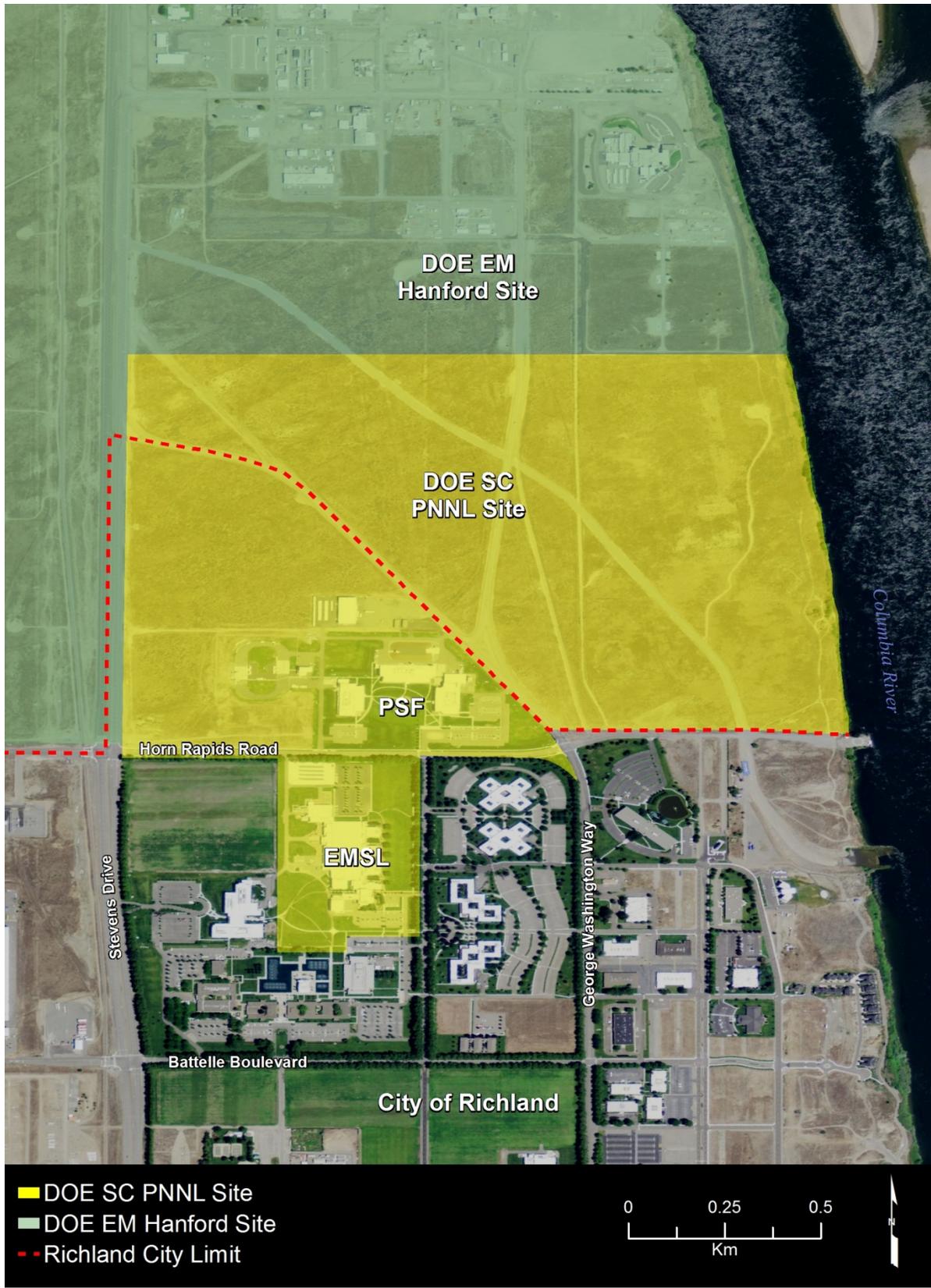


Figure 1.1. PNNL Site and Surrounding Area

2.0 Resource Management Goals and Responsibilities

Effective resource management requires administrative procedures to protect the resource, resource monitoring to determine status and trends and to assess potential and actual impacts, and strategies for adaptive management and protection to minimize and avoid impacts. PNSO manages the resources at the PNNL Site as required by applicable laws, regulations, and Executive and DOE Orders to protect cultural and biological resources. PNSO evaluates the potential for these resources to be adversely affected by DOE activities, and conducts activities in a manner that assures the long-term maintenance, protection, and restoration of such resources.

2.1 Resource Management Goals

PNSO resource management goals are based on DOE policies and management guidelines and are summarized as follows:

- Act to preserve and restore the resources under PNSO stewardship as valuable national resources.
- Endeavor to enhance an awareness and appreciation of resource values and their preservation, restoration, and enhancement in DOE managers, employees, and contractors.
- Integrate resource management goals and administrative procedures into relevant program- and project-level activities to avoid or minimize adverse impacts on biological and cultural resources.
- Coordinate with other governmental agencies and stakeholders, as applicable, on biological and cultural resource management issues in an open and cooperative manner.
- Protect archaeological resources using an approach consistent with the Department of the Interior's National Strategy for Federal Archeology (USDOI 1999).
- Promote outreach with traditional people who are the stakeholders of the local biological and cultural resources to assure their access to these resources and verify that tribal and stakeholder expectations are understood and considered in DOE decision making.
- Implement resource management responsibilities and stewardship consistent with federal laws and regulations, as well as Executive Orders and DOE Orders and Policies.
- Achieve compliance with laws, regulations, Executive Orders, and DOE Directives related to biological and cultural resources.
- Integrate biological and cultural resource information into land- and facility-use plans to assure that broad-scale land-use planning and specific site-selection decisions consider cultural and biological resource values, and avoid or minimize cumulative impacts on these resources.

PNSO is required by applicable laws, tribal treaties, regulations, and DOE Orders to protect biological and cultural resources, to evaluate the potential for cultural and biological resources to be adversely affected by DOE activities, and to conduct such activities in a manner that assures the short-term and long-term protection and perpetuation of such resources. Regulatory drivers for environmental protection of both the cultural and biological resources are listed in Appendix A.

2.2 Roles and Responsibilities

The implementation of the PNSO CBRMP is supported by PNSO, PNNL, the DOE Office of Science, Integrated Support Center staff, and DOE-Headquarters staff, and is implemented in compliance with DOE policy. The DOE Historian serves as the DOE's Federal Preservation Officer and provides coordination among the various DOE organizations and technical assistance as necessary.

The PNSO Operations Division has the lead for assuring compliance with this plan, DOE policy, and applicable requirements (see Appendix A). Oversight of the PNSO program is assigned to the PNSO cultural and biological resources representative.

Staff at PNNL provides technical support for resource identification, review and compliance, protection, mitigation, and reporting. This support is provided by cultural resources professionals who meet the requirements established in the Secretary of the Interior's Professional Qualifications Standards (Title 36 of the *Code of Federal Regulations* Part 61 [36 CFR Part 61] Appendix A) or other standards that are deemed to be otherwise qualified by the Washington State Department of Archaeology and Historic Preservation (DAHP). Biological resource professionals supporting these activities meet the position requirements established by the U.S. Office of Personnel Management for biologists, wildlife biologists, botanists, or ecologists.

Cultural reviews are generally required for all projects and activities that are 1) funded or permitted by DOE or any other federal entity, 2) occur on federal property, or 3) require a federal permit. Cultural reviews also are required for projects that require analysis under the *Washington State Environmental Policy Act*. Biological resource reviews are generally required for all projects with the potential to affect biological resources. Details of the review processes and requirements are provided in Sections 4 and 5.

3.0 Existing Environment at the PNNL Site

This section provides information regarding the current condition and status of resources found on the PNNL Site near Richland, Washington. It includes descriptions of the operational context, major facilities, environment, and the biological and cultural resources.

3.1 PNNL Site Environmental Setting

The PNNL Site lies within the lowest and most arid portion of the Columbia Basin Ecoregion. Seasonal average temperatures range from about 1°C (34°F) in winter to about 23°C (74°F) in summer, with seasonal extremes ranging from below -18°C (0°F) in winter months to over 38°C (100°F) in summer months. Annual precipitation averages approximately 18 cm (7 in.), half of which occurs between November and February.

The PNNL Site lies within the Pasco Basin, above a gentle syncline formed by the intersection of the Yakima Fold Belt and the un-deformed eastern Columbia Basin. The uppermost basalt flow belongs to the Ice Harbor member of the Saddle Mountains basalt. The overlying sediment layers are relatively thin, consisting of Ringold Formation and Hanford formation sediments. These sediment layers are predominantly coarse sandy alluvial deposits mantled by windblown sand. Soils of the PNNL Site are primarily sands to sandy loams.

The unconfined water table generally is found in the Ringold Formation at a depth of 30 to 62 ft below ground surface. Fluctuations in the Columbia River flow affect the groundwater levels. Groundwater also is influenced by artificial recharge associated with the city of Richland's North Richland recharge basins (approximately 2 miles south of the PNNL Site) and nearby irrigated farming. Water is pumped from the Columbia River to the recharge basins and subsequently pumped from nearby wells. This system is used by the city of Richland as a backup filtration system for city water. Because an excess of water is pumped into the recharge basins, a hydraulic mound is created in the water table, which helps to reduce the potential for groundwater flow from DOE operations on the Hanford Site into this area.

3.2 PNNL Site Cultural Resources

The cultural resources of the Columbia Plateau are diverse, ranging from early pre-contact times to the atomic age. More than 8,000 years of prehistoric human activity in this largely arid environment of the middle Columbia River region have left a number of archaeological sites along the river shores. Throughout most of the region, hydroelectric development, agricultural activities, and construction have destroyed or covered most of these sites. However, because the public is excluded, archaeological sites present on the PNNL Site have experienced less destruction. This section describes the regional and historic context of the resources located there, and provides a brief description of known resources.

3.2.1 Regional and Historic Context

The Columbia Plateau contains an extensive record of human occupation documenting a series of overlapping cultural landscapes stretching back thousands of years, each layer of which tells the story of how people have used the landscape. Of relevance to the PNNL Site are the historic contexts for Native American pre-contact and ethnohistoric eras, the farming era, and the Manhattan Project and Cold War

era. Three distinct landscapes are defined: the Native American Cultural Landscape, the Early Settlers and Farming Cultural Landscape, and the Manhattan Project and Cold War Era Cultural Landscape.

3.2.1.1 Native American Pre-Contact Period

Archaeological investigations conducted on the Columbia Plateau enabled the creation of a cultural chronology dating back to the end of the Pleistocene. Native Americans have lived in and around the region for thousands of years. More than 8,000 years of pre-contact human activity (Table 3.1) have left extensive archaeological deposits along the Columbia River and, to a lesser degree, the off-river interior.

3.2.1.2 Native American Ethnohistoric/Ethnographic Period

Ethnographically, the Sahaptin-speaking Cayuse, Walla Walla, Palouse, Nez Perce, Umatilla, Wanapum, and Yakama used this locale in the Columbia Plateau region. During this period, local residents relied on a pattern of seasonal rounds that included semi-permanent residences in villages along major waterways during the winter months and a heavy reliance on procuring salmon and other anadromous fish during the spring and fall. With the arrival of spring, small groups living in temporary camps would travel into the canyons and river valleys to gather roots. Seasonal camps were used in the inland areas during the spring and early summer months. By late summer or early fall, seasonal rounds focused on ripening berries in the mountains. It was this time of the year when the acquisition of food came to an end and families returned to the winter villages (Bard and McClintock 1996; Dickson 1999; Chatters 1980; and Galm et al. 1981). Important cultural sites associated with both the pre-contact and ethnohistoric eras are located on the PNNL Site.

Sacred and ceremonial areas, such as mountains and rivers where food and medicinal plants were and continue to be gathered, are dispersed across the landscape. Native American descendants of the area's original inhabitants continue to use this landscape to access traditional resources and places. These descendants include members of the Wanapum, Yakama Nation, Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of the Colville Reservation.

3.2.1.3 Euro-American Period

The Lewis and Clark expedition of 1805 began the Euro-American exploration and settlement of the region. The explorers sought trade items from Native Americans and trade routes were established. It was not until the late 19th and early 20th centuries, however, that the area was intensively settled. During this period, settlers farmed and raised livestock, mined, and built settlements along the Columbia River. Historic archaeological resources mark the locations where gold mining, stock raising, farming, and drilling for natural gas took place from the 1850s to 1943. Historical activity began in the early 1900s in the region around Richland, when farming communities expanded with the construction of large-scale irrigation projects, including canals. One such canal, a lateral of the Richland Canal, passed through what is now the PNNL Site transporting water to the small community of Fruitvale, located in or near what is now the 300 Area on the Hanford Site. Other historic activity is indicated by the presence of historic trash dumps and isolated concrete features; evidence indicates, however, that no farms were located on the PNNL Site.

Table 3.1. Pre-Contact Cultural Sequence for the Columbia Plateau Region

Cultural Period	Years Before Present	Site Types	Architecture	Subsistence	
General Columbia Plateau					
Windust Phase	11,000 – 8,000	Rock shelters, caves, game processing sites, lithic reduction sites; isolated lithic tools. Examples include Marmes Rockshelter, Bernard Creek, Lind Coulee, Kirkwood Bar, Deep Gully, Granite Point, Fivemile Rapids, and Bobs Point.	Rock shelters and caves; open habitation sites. No evidence of constructed dwellings or storage features.	Large mammals supplemented with small mammals and fish. Toolset: Windust, Clovis, Folsom, and Scottsbluff points; contracting stemmed points and/or lanceolate points; cobble tools.	
Mid-Columbia Region—Vantage Area					
Cascade/Vantage Phase	8,000 – 4,500	Lithic scatters, quarry sites, resource processing sites, temporary camps	Rock shelters and caves; open habitation sites.	Mobile, opportunistic foragers subsisting on fish, mussels, seeds, and mammals. Basalt leaf-shaped Cascade and stemmed projectile points, ovate knives, edge-ground cobble tools, microblades, hammerstones, core tools, and scrapers.	
Frenchman Springs Period	4,500 – 2,500	Habitation sites along major rivers, confluences, tributaries, canyons, and rapids. Lithic scatters, quarry sites, resource processing sites, seasonal round of upland to lowland travel for resource procurement; seasonal camps.	House dwellings, including semi-subterranean	As earlier, but with increased use of upland resources, seeds and roots. Groundstone and cobble tools, mortars, pestles, contracting stemmed, corner-notched, and stemmed projectile points, hopper mortar bases and pestles, knives, scrapers, and gravers. Wider tool material variety.	
Cayuse Phase	I	2,500 – 1,200	Habitation sites at major rivers, confluences, tributaries, canyons, and rapids. Lithic scatters, quarry sites, resource processing sites, seasonal round camps. Ideological and spiritual sites.	Pithouses with wall benches	Reliance on riverine resources, fish, and botanicals; basal-notched and corner-notched projectile points (most corner-notched); variety of tools including groundstone, scrapers, lanceolate and pentagonal knives, net weights, cobble tools, drills, etc.
	II	1,200 – 900	Same as Cayuse Phase I	Pithouses without wall benches	Same as Cayuse Phase I
	III	900 – 250	Increased mobility and hunting ability due to horse introduction. Large village habitation sites along rivers, seasonal round camps. Same site types as Cayuse Phases I & II.	Pit longhouse village sites	Decrease in corner-notched points, increase in stemmed and side-notched projectile points, fine pressure flaked tools. Increase in trade goods.
Sources: Morgan et al. (2001); Walker (1998); Sharpe and Marceau (2001); Swanson (1962); Nelson (1969); Galm et al. (1981); Benson et al. (1989); Thoms et al. (1983); Green (1975); Rice (1980).					

3.2.1.4 Manhattan Project and Cold War Era

The PNNL Site north of Horn Rapids Road was originally part of the DOE's Hanford Site, which the federal government created as part of the Manhattan Project for the war effort in 1943. The war effort rapidly transformed the Hanford Site from an isolated agricultural region to an industrial complex dedicated to the production of plutonium eventually used in the first atomic bombs. Because of the importance of its national defense mission to world history, Hanford's Manhattan Project and Cold War Era Cultural Landscape is critical for historical interpretation of this period on a national scale. B Reactor, where the plutonium for the first atomic bomb was made; the 300 Area, where nuclear research and fuel fabrication was conducted (adjacent to the north boundary of the PNNL Site); and the 200 East and West Areas, where the plutonium was processed, are but a few of the historic remains from the Manhattan Project and Cold War Landscape. DOE identified a National Register-eligible Hanford Site Manhattan Project and Cold War Era Historic District that serves to organize and delineate the evaluation and mitigation of Hanford's plutonium-production built environment. PNNL Site facilities are not part of this district.

In the late 1940s the present site of PNNL and the surrounding area was a construction housing camp for postwar Hanford Site development. From 1951 to 1961 it was known as Camp Hanford, and was used to house military personnel and support activities. In 1964, the federal government issued a request for contractors to bid to operate the Hanford Site laboratories to conduct research and development activities related to nuclear energy and the peaceful use of nuclear materials. In January 1965, Battelle was awarded the contract to operate what was then called Pacific Northwest Laboratory and, as part of the successful proposal, invested its own funds to construct facilities to conduct non-Hanford Site research to promote research and development around the Pacific Northwest. Battelle bought 230 acres of the former Camp Hanford from the city of Richland to build its facilities. In 1994 Battelle sold approximately 30 acres to DOE as a site for construction of the EMSL. The PNNL Site was created when approximately 141 ha (348 ac) acres of land north of Horn Rapids Road and the EMSL site were reassigned from the DOE Office of Environmental Management to the DOE Office of Science in 2003.

3.2.2 Known Cultural Resources

Much of the PNNL Site has been surveyed previously for cultural resources in compliance with the *National Historic Preservation Act of 1966* (NHPA) Section 106. In December 2004, a Cultural Resources Review (CRR) of the proposed site for construction of the Physical Sciences Facility (PSF) was conducted (Prendergast-Kennedy 2004). The review found that the PSF development would have an adverse effect on the Richland Irrigation Canal north of Horn Rapids Road. A Memorandum of Agreement (MOA) was developed to address the adverse effects. The terms and actions in the MOA were satisfied and submitted to and accepted by DAHP (DAHP 2007). In addition, PNNL and PNSO developed an interpretive flier to communicate the history and significance of the Richland Irrigation Canal (PNNL 2007). In 2013, PNNL proactively performed a survey of approximately 40 ha (99 ac) within the PNNL Site, and provided the results of that survey to the Washington State Historic Preservation Office (SHPO)(Mendez et al. 2015). The presence of several previously known resources was confirmed but no new cultural resources were identified by that field survey.

Since 2004, regular archaeological construction monitoring and surveys have been conducted to support DOE activities undertaken on the PNNL Site. No archaeological material has been discovered by these construction monitoring efforts. These results indicate that portions of the PNNL Site have low potential for containing subsurface archaeological material. Previous inventories and surveys have

identified and documented 22 places of historical and cultural interest on the PNNL Site. There are three Native American sensitive cultural sites near the Columbia River. Two of these cultural resource sites are listed on the Washington State Heritage Register as part of the Hanford South Archaeological District, but none of the three have been formally evaluated for eligibility for listing in the National Register of Historic Places (NRHP). These three sites are monitored annually by a qualified archaeologist with tribal participation to assure that the resources are not being adversely affected. Of the remaining 19 documented sites, 11 are historic-era debris scatters, 5 are historic-era isolated finds, 2 are prehistoric-era isolated finds, and 1 is the historic Richland Irrigation Canal. Three historic-era sites have not been evaluated, but all of the other sites have been formally determined to be ineligible for listing in the NRHP except the Richland Irrigation Canal that was recommended as being NRHP-eligible. The canal was evaluated and mitigated under an MOA with DAHP during the development of the PSF Phase One construction.

The oldest building that DOE owns on the PNNL Site is the EMSL, which was constructed in the mid-1990s. Therefore, there are no buildings on the PNNL Site that are eligible for listing in the NRHP.

3.3 PNNL Site Biological Resources

The PNNL Site environment includes developed and maintained landscapes and infrastructure associated with existing buildings; previously disturbed lands associated with construction and infrastructure emplacement; and relatively undisturbed lands, including Columbia River shoreline and native shrub-steppe uplands, that have been protected from most development since before 1943. Biological resources found on the PNNL Site include flora and fauna associated with three different kinds of habitats: existing facilities and maintained landscapes, shrub-steppe habitats, and riparian and riverine habitats. Maintained landscapes include semi-natural habitats such as planted ornamental trees and shrubs, and manicured lawns, as well as artificial structures used by wildlife such as. Much of the northern portion of the PNNL Site has not been disturbed for development and sustains native shrub-steppe upland habitats (Figure 3.1). The portion adjacent to the Columbia River contains a narrow strip of riparian habitat that grades into the riverine habitats of the Columbia River. Both shrub-steppe and riparian habitats are listed by the Washington Department of Fish and Wildlife (WDFW) as priority habitats and are thus considered priorities for management and conservation (WDFW 2008). *Priority habitats* are those habitat types or elements with unique or significant value to a diverse assemblage of species (WDFW 2008).

3.3.1 Facilities and Maintained Landscapes

The facilities and maintained landscape of the PNNL Site are typical of urban landscapes in the region. The addition of irrigation to sustain developed landscapes (lawns, trees, flower plantings) in the semi-arid environment provides resource islands that are otherwise not available for many species. Common avian species adapted to and readily observed within the maintained habitats include the Canada goose (*Branta canadensis*), American robin (*Turdus migratorius*), western kingbird (*Tyrannus verticalis*), and house finch (*Haemorhous mexicanus*). Other common species observed in maintained landscapes include Nutall's cottontail rabbit (*Sylvilagus nuttallii*) and gopher (bull) snake (*Pituophis catenifer sayi*).

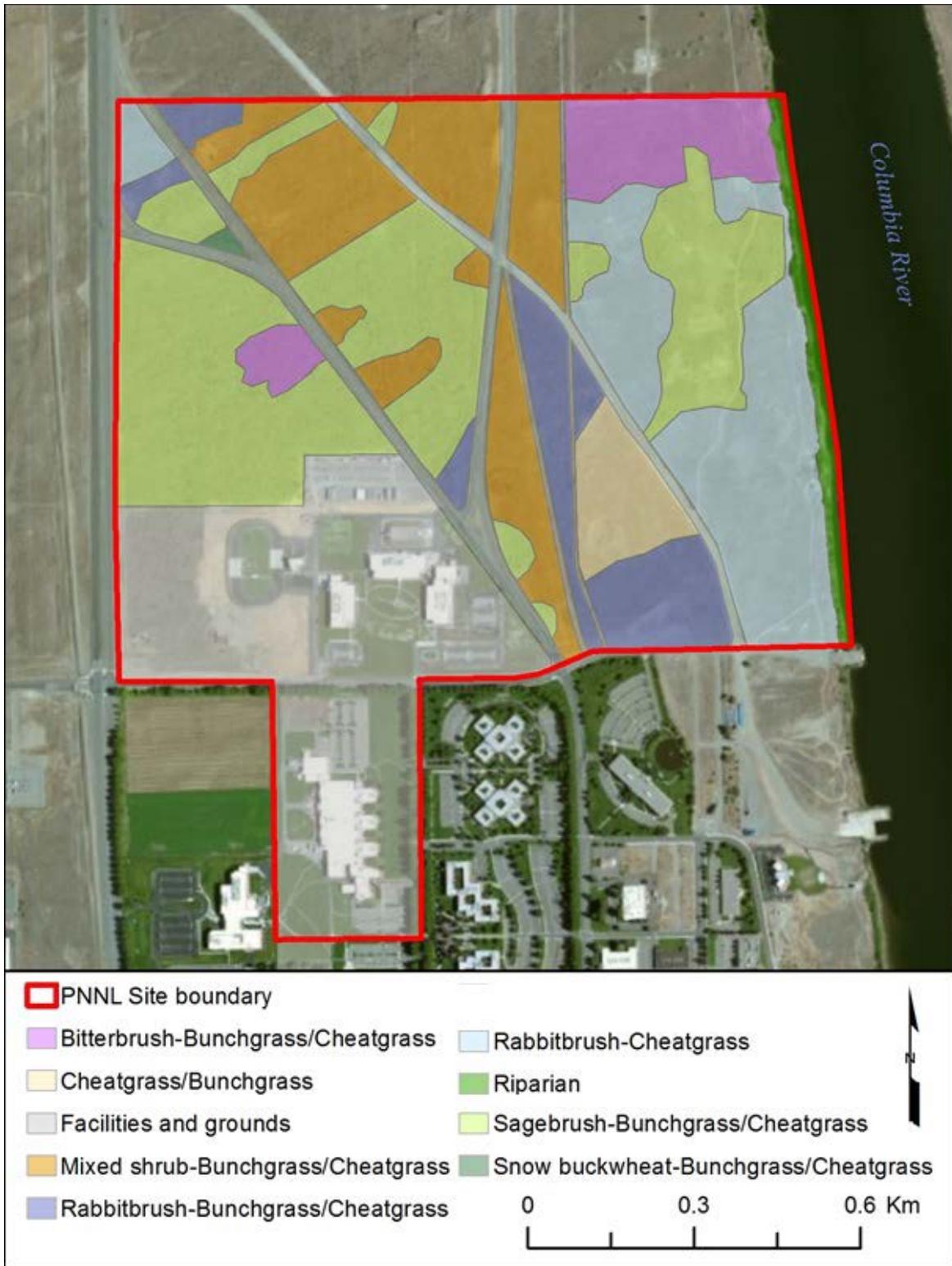


Figure 3.1. Habitats on the Federally Owned PNNL Site

3.3.2 Shrub-Steppe Uplands

The majority of the PNNL Site north of Horn Rapids Road consists of shrub-steppe habitats. The Columbia Basin (Plateau) Ecoregion historically included more than 14.8 million acres of steppe and shrub-steppe vegetation across most of central and southeastern Washington, as well as portions of north-central Oregon. Much of this land has been developed for agriculture, industry, and other purposes. In the early 1800s, the dominant vascular plants in the area were big sagebrush (*Artemisia tridentata*) underlain by perennial bunchgrasses and forbs. With the advent of Euro-American settlement, livestock grazing and agricultural production contributed to colonization by non-native plant species that currently dominate portions of the Columbia Plateau landscape. Less than half of the original acreage of shrub-steppe is estimated to remain in this ecoregion, and much of the remaining habitat is fragmented and degraded (WWHCWG 2012).

Native shrub-steppe plant communities remaining on the PNNL Site are dominated primarily by big sagebrush and perennial bunchgrasses. Antelope bitterbrush (*Purshia tridentata*) and gray and green rabbitbrush (*Ericameria nauseosa* and *Chrysothamnus viscidiflorus*, respectively) are common shrubs co-occurring with big sagebrush. The most common perennial bunchgrass in the area is Sandberg's bluegrass (*Poa secunda*), but several stands of the native needle-and-thread grass (*Hesperostipa comata*) dominate sandy swales within the area, and Indian rice-grass (*Achnathrum hymenoides*) also is represented in several sandy areas growing with antelope bitterbrush. Some portions of the sagebrush stands also have a significant cover of cheatgrass (*Bromus tectorum*). Common native forb species include Carey's balsamroot (*Balsamorhiza careyana*), long-leaved phlox (*Phlox longifolia*), yarrow (*Achillea millefolium*), and daisy fleabane (*Erigeron* spp.). Turpentine springparsley (*Pterixia terebinthina*) also often occurs on sandy soils dominated by this community type. Species diversity may be lower in this community type than in shrub-steppe communities found in the surrounding foothills. Several Native American Tribes have identified food and medicinal plant species within the habitat.

Shrub-steppe uplands on the PNNL Site provide habitat or transit avenues for numerous mammals, including coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), porcupine (*Erithizon dorsatum*), and numerous small mammal species typical of those found in the region. A wide variety of migratory bird species are also known to use the shrub-steppe habitats. The most common and abundant species observed are the horned lark (*Eremophila alpestris*) and western meadowlark (*Sturnella neglecta*). Other species that were observed nesting or are likely to nest in the area include, but are not limited to, mourning dove (*Zenaida macroura*), lark sparrow (*Chondestes grammacus*), and the non-native California quail (*Callipepla californica*). Sagebrush-steppe communities support a variety of wildlife, including several Washington State species of concern (Table 3.2).

3.3.3 Riparian and Riverine Habitat

In addition to shrub-steppe upland communities, a narrow riparian community exists along the Columbia River shoreline on the eastern part of the PNNL Site (Figure 3.1). Riparian vegetation is limited in extent; narrow bands near the water consist of a number of forbs, grasses, sedges, reeds, rushes, cattails, and deciduous trees and shrubs. There is a cluster of poplars (*Populus* spp.), and white mulberry (*Morus alba*) sparsely scattered along the shoreline. Shrub willows (*Salix exigua*) and wild rose (*Rosa woodsii*) are common shrubs in the riparian zone. Several plant species of concern potentially may occur along the shoreline, including persistent sepal yellowcress (*Rorippa columbiae*), lowland toothcup (*Rotala ramosior*), and grand redstem (*Ammania robusta*).

Table 3.2. Wildlife and Plant Species of Conservation Concern That Potentially Occur on the PNNL Site

Wildlife	Genus and Species	Federal Status^(a)	State Status^(b)
Black-tailed jackrabbit	<i>Lepus californicus</i>		Candidate
Burrowing owl	<i>Athene cunicularia</i>	Species of Concern	Candidate
Loggerhead shrike	<i>Lanius ludovicianus</i>	Species of Concern	Candidate
Northern sagebrush lizard	<i>Sceloporus graciosus</i>	Species of Concern	Candidate
Sage sparrow	<i>Amphispiza belli</i>		Candidate
Townsend ground squirrel	<i>Spermophilus townsendii</i>	Species of Concern	Candidate
Plants	Genus and Species	Federal Status^(a)	State Status^(b)
Grand redstem	<i>Ammania robusta</i>		Threatened
Persistent sepal yellowcress	<i>Rorippa columbiae</i>	Species of Concern	Endangered
Lowland toothcup	<i>Rotala ramosior</i>		Threatened

Sources: WDFW (2013) and WDNR (2012)

- (a) Federal species of concern may be in need of conservation actions ranging from monitoring of populations and habitat to listing as threatened or endangered. Federal species of concern receive no legal protection and the classification does not imply that the species will eventually be proposed for listing as threatened or endangered (USFWS 2013).
- (b) Candidate species are species that WDFW will review for possible listing as State Endangered, Threatened, or Sensitive (WDFW 2013). Threatened species are native species likely to become endangered without cooperative management or removal of threats. Endangered species are native species that are seriously threatened with extinction within the state (WAC 232-12-297).

Riparian habitats along the Columbia River in Washington, such as on the PNNL Site, support a diverse assemblage of wildlife. Wintering bald eagles (*Haliaeetus leucocephalus*) perch in trees along the river, and the riparian zone along with the upland area is used as a territory for nesting osprey (*Pandion haliaetus*). A large number of migratory bird species, such as western kingbirds and Bullock's orioles (*Icterus bullockii*), use riparian trees and shrubs for nesting habitat. Many migratory bird species use the riparian habitats for resting and feeding during the spring and fall migration.

Riverine habitat includes the river channel and wetted shoreline associated with the riparian vegetation. Along the shoreline, the substrate consists of rock, cobbles, or gravel with occasional patches of sand that provide habitats for a variety of freshwater species including bivalves and amphibians. The emergent vegetation along the shoreline supports terrestrial and aquatic insects that provide forage for fish, waterfowl, and shorebirds. Beaver (*Castor canadensis*) and muskrats (*Ondatra zibethica*) rely on shoreline and riverine habitat for foraging and denning materials. Mink (*Mustela vison*), raccoon (*Procyon lotor*), bald eagle, and osprey feed on fish in this habitat.

4.0 Cultural Resource Compliance and Management

PNNL research projects are conducted on the PNNL Site and on numerous other federal sites and many non-federally owned sites and facilities throughout the United States. In addition, federal funds may be used to operate, maintain, and modify non-DOE-owned facilities in support of PNNL research projects. Compliance with certain laws and regulations, such as NHPA Section 106, is required whenever an action occurs on federal land, uses federal funding, or requires a federal permit or license. Therefore, work and projects conducted by PNNL at any location must comply with federal and state regulations regarding cultural resources. Research projects conducted at other government or private facilities will also comply with management plans or requirements specific to those sites. For research activities conducted at other government or private facilities, PNSO will coordinate with the host and/or funding agency to identify the appropriate lead agency for NHPA Section 106, and other responsibilities.

PNSO is committed to assuring that the cultural resource management for the PNNL Site meets the requirements of federal regulations, addresses the concerns of stakeholder groups, minimizes adverse impacts on cultural resources, and integrates historic preservation into routine management and project-specific compliance activities. At all times, the management of cultural resources attempts to combine preservation and mitigation strategies to meet the mission needs of PNSO and PNNL. PNSO cultural resource management activities are accomplished in accordance with the requirements identified by DAHP (<http://dahp.wa.gov/>) and 36 CFR Part 800. This section describes the methods, actions, and strategies used to comply with federal regulations and to manage the cultural resources under PNSO oversight.

4.1 Cultural Resource Compliance

Section 106 of the NHPA requires federal agencies to take into account the effect of their activities on properties listed in or determined eligible for listing in the NRHP and to consult with the SHPO, the Tribes, and the Advisory Council on Historic Preservation (ACHP), if necessary, concerning those effects and determinations. CRRs and consultations consistent with NHPA Section 106 are conducted for all actions on the PNNL Site with the potential to affect cultural or historic resources. The PNSO process for implementing NHPA Section 106 is the same for activities located on the PNNL Site as for activities located on other federal or non-federal properties. PNNL's process for implementing the NHPA also helps to assure that PNNL maintains compliance with other cultural resource-related laws such as the *Archaeological Resources Protection Act* (ARPA) and the *Native American Graves Protection and Repatriation Act* (NAGPRA), among others described in Appendix A.

4.1.1 Normal Section 106 Compliance Process

Section 106 of the NHPA requires federal agencies to take into account the effect of their activities on properties listed in or determined eligible for listing in the NRHP and to consult with the SHPO, and the ACHP if necessary, concerning those effects and determinations. For each proposed project, PNNL and PNSO must determine whether it constitutes an undertaking that could result in changes in the character or use of resources that are eligible for listing in the NRHP. The CRR must be given full consideration in project planning and a CRR should be included in the early stages of project planning to allow sufficient time for archival searches, fieldwork, consultation, schedule, and seasonal constraints. Figure 4.1 provides an outline of the Section 106 process.

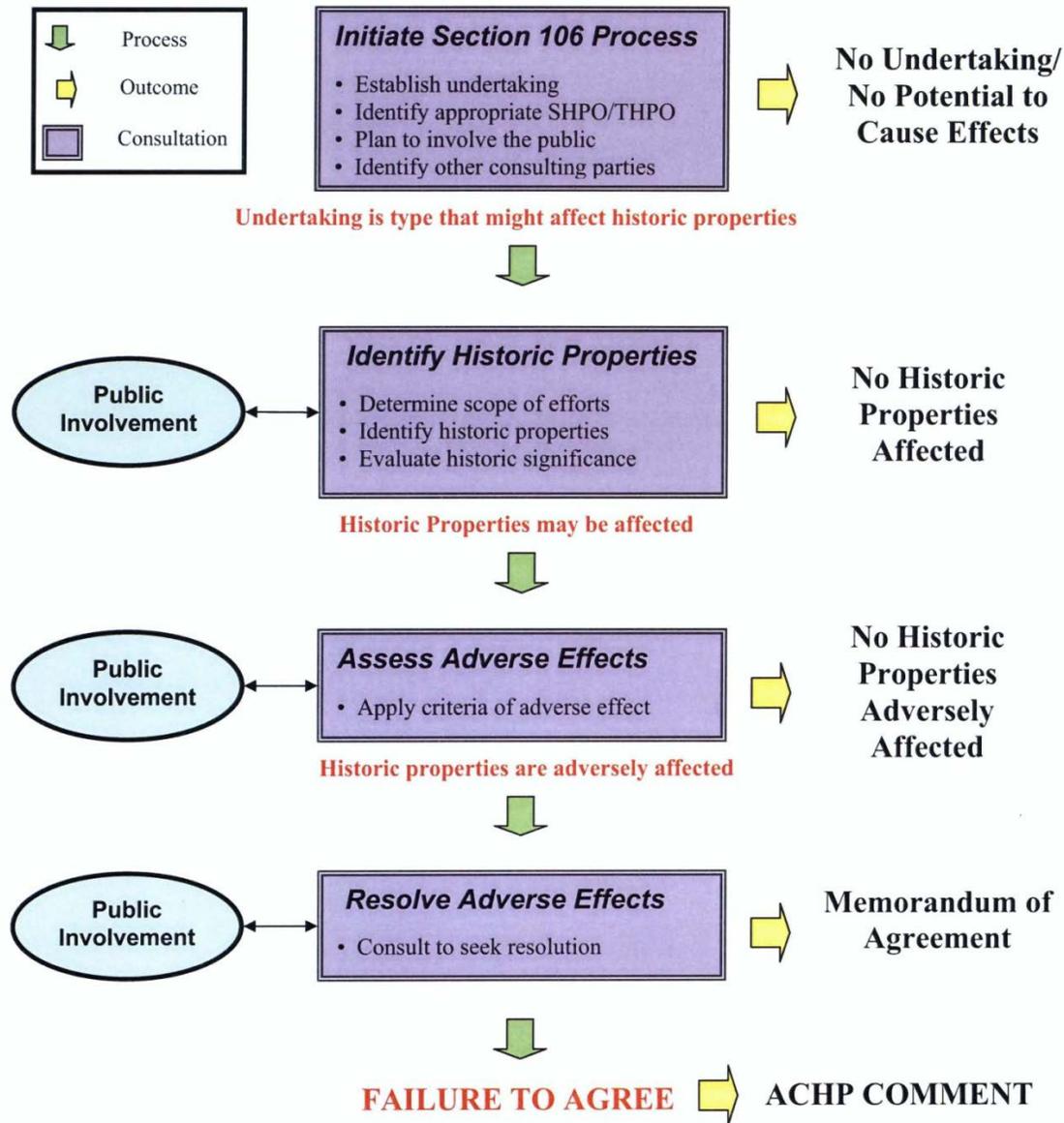


Figure 4.1. Diagram of the Section 106 Process

To comply with NHPA Section 106 and Executive Order 11593, PNSO reviews actions that have the potential to affect cultural resources following the protocol described at 36 CFR Part 800. Actions that require a CRR are normally identified as part of PNNL’s formal *National Environmental Policy Act* (NEPA) program, including the Electronic Prep and Risk evaluations, the review of facilities and operations maintenance planned work, and facility modification permits. These actions include a wide range of activities and magnitude of potential impacts, including site development for new facilities, operations and maintenance actions, and research projects. The formal NHPA Section 106 compliance process described below is not required for research projects and facility maintenance actions that occur entirely within facilities or otherwise are the type of undertaking that have no potential to affect cultural resources.

In general, CRRs for NHPA Section 106 compliance on the PNNL Site are required for all projects and activities that involve any of the following:

- surface disturbance of land (e.g., drilling, excavating, vegetation clearing)
- modifications of prominent land forms (e.g., shoreline)
- alteration of tagged historic artifacts
- modifications of buildings that are eligible or potentially eligible for listing in the NRHP, including abandoned buildings that are conducted using federal funding
- deactivation or decommissioning of buildings
- siting decisions for buildings and facilities.

All federally funded research projects must comply with NHPA Section 106. PNSO is the lead federal agency for any projects on the PNNL Site, or when DOE funding is used, or when the funding contract stipulates that PNNL will provide NHPA Section 106 coverage at other locations. PNSO will likely not be the lead federal agency for projects at other federal facilities, and often is not the lead agency for offsite projects funded by other federal entities. PNSO will coordinate with the host and/or funding agencies to identify the appropriate lead agency for NHPA Section 106 compliance.

CRRs for PNNL-related activities are normally conducted by staff at PNNL, but can be conducted by outside parties or by other federal agencies if they are the property owner or project-funding entity, depending on the specific contract or project arrangements.

Projects that require a CRR are identified through the NEPA review conducted as part of the Electronic Prep and Risk review for every research project, and the environmental reviews performed for planned maintenance and operations actions or facility modification permits.

The preparation of a CRR involves four steps: 1) notify the SHPO, Tribes, and other potential consulting parties; 2) review existing information and records; 3) physically inspect the area using a developed archaeological survey methodology; and 4) write a survey report that documents the conclusions of the review. Literature searches and review of existing information include querying the PNSO Cultural and Historic Resources Program Records and Cultural Resource Geographic Information System (GIS) Database, as well as conducting online queries of the DAHP Washington Information System for Architectural and Archaeological Records Data (WISAARD) electronic database if the project is in Washington State, or records provided by the appropriate SHPO in another state. The literature review, monitoring, and archaeological surveys, and preparation of the written report are conducted by archaeologists who meet the Secretary of the Interior's Professional Qualifications Standards (36 CFR Part 61, Appendix A).

Once the draft CRR is complete, it is provided to the consulting parties for a 30-day comment period. At the conclusion of the comment period, responses to all comments are prepared, and the CRR may be modified based on comments received. Additional, follow-on consultation may be needed if there is disagreement among the consulting parties.

The PNSO cultural resources representative is responsible for and coordinates all official communications between PNSO, the Tribes, and SHPO.

4.1.2 Emergency Review Process

Consistent with 36 CFR 800.12, emergency situations in which there is an immediate risk to employee or environmental safety do not require a cultural resources review until the emergency is over. In

emergency situations, the responsible parties shall contact the PNNL Cultural Resources Program Manager or the PNSO cultural resources representative to determine if sensitive resources are located in the affected area and explore options that could minimize damage. For emergency situations such as broken water lines that supply water to fire hydrants and gas/ fuel line leaks, the PNNL Cultural Resources Program Manager or the PNSO cultural resources representative may provide verbal “per telecom” or email approval to proceed with actions to rectify the emergency, and request that a CRR request form be submitted as soon as possible. A retroactive review will then be done; and the project personnel will be instructed to leave excavations open so as to allow inspection by an archaeologist. These emergency situations are the only instance that a verbal approval to proceed may be granted. When possible, emergency projects will follow the full review procedure and, per 36 CFR Section 800.12(b), will only require a 7-day review by the SHPO and Tribes.

4.1.3 Contingency for Unexpected Discoveries

Despite best efforts to identify potential adverse effects of an activity prior to its implementation, unexpected discovery of cultural materials or even human remains is always possible. The following sections provide PNSO’s contingency plan in the event of an unexpected discovery.

4.1.3.1 Unexpected Discovery of Cultural Materials

While field surveys should locate most eligible properties within a project area, it is possible that unrecorded archaeological materials may be discovered during project activities, particularly if the activities involve digging or excavating. If this happens, the project personnel must stop all activities that may cause additional disturbance of the artifacts and notify the single point of contact at 375-2400 who will then notify the PNSO Cultural Resource Coordinator and the PNNL NEPA Subject Matter Expert (SME). Discovery of unrecorded cultural resources usually requires additional survey and evaluation by a Department of Interior-qualified archaeologist to assess the significance of the cultural resource. If the evaluation indicates an NRHP-eligible site is present, mitigation measures, including data recovery, will be initiated. If data recovery is not necessary, site records will be updated and emergency consultation with DAHP will be conducted. If the artifacts include human remains, funerary objects, or grave goods, provisions of NAGPRA would apply and PNSO would work with DAHP and the Tribes to follow the guidance provided by 43 CFR 10(4) regarding NAGPRA.

4.1.3.2 Discovery of Human Remains

If ground-disturbing activities encounter human skeletal remains all activity that may cause further disturbance of those remains must immediately cease, and the area must be secured and protected from further disturbance. The project personnel will immediately call 375-2400 who will notify the PNSO Cultural Resource Coordinator and the PNNL NEPA SME. The finding of human skeletal remains also must be immediately reported to the county medical examiner/coroner and local law enforcement. The remains should not be touched, moved, or further disturbed. The county medical examiner/coroner will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. If the coroner determines the remains are non-forensic (i.e., not of recent origin and not indicative of a crime), PNSO will work with DAHP to follow the guidance provided by 43 CFR 10(4) regarding NAGPRA.

4.1.4 Cultural Resources Outreach and Consultation

As a federal agency, DOE is responsible for compliance with the NHPA Section 106 review process, and works closely with DAHP and the federal ACHP. PNSO staff maintains contact with DAHP staff to assure that DAHP is notified of PNSO undertakings and that all projects are reviewed in a timely manner.

As required by the NHPA, consultation is initiated with federal, state, and local agencies, as well as Native American Tribes and other private individuals, regarding proposed activities. In addition, under the ARPA, each federal land manager establishes a program to increase public awareness of the significance of the archaeological resources located on public lands and tribal lands and the need to protect such resources. PNSO outreach efforts are coordinated with DOE-RL cultural resource management.

PNSO cooperates and consults Tribes with historical and legal ties to the lower Columbia Basin to address the protection of cultural and biological resources. Cooperation may include technical-level interactions and government-to-government interactions. Outreach and interactions are intended to promote a spirit of cooperative management and focus on DOE decisions and activities that involve potential impacts on cultural and biological resources to assure that tribal interests, concerns, and expectations are considered.

4.2 Cultural Resource Management on the PNNL Site

In addition to the NHPA Section 106 requirements that all PNNL activities must comply with regardless of project location, other cultural resource laws such as NHPA Section 110 and the ARPA require that PNSO implement monitoring and protection actions on land that it owns and manages. These requirements would not be applicable to non-PNSO managed locations where PNNL work may be performed.

4.2.1 NHPA Section 110 Compliance

Section 110 of the NHPA requires federal agencies to be stewards of cultural resources under their jurisdiction, and authorizes them to inventory and identify cultural resources under their jurisdiction and to evaluate them for eligibility for listing in the NRHP. Annual monitoring of known resources is an important component of meeting the stewardship responsibilities outlined in NHPA Section 110. Monitoring provides information needed to protect resources and maintain resource integrity by evaluating and documenting the condition of the sites, assessing potential and actual threats to sites, and identifying sites that require attention to stabilize or prevent deterioration of the resource. PNNL staff performs annual monitoring of the three archaeological sites located on the PNNL Site in coordination with cultural resource staff from area Tribes. This monitoring involves on-the-ground inspection of important areas, documentation of changes since the previous site visit, and an email report to the PNSO Cultural Resource Coordinator. Copies of the monitoring report are provided to DAHP and affected Tribes. Two of the monitored sites, while primarily on the PNNL Site, are partially located on property managed by the DOE-RL and/or the U.S. Army Corps of Engineers (USACE). PNSO is responsible only for the resources on the PNNL Site portion. Copies of the monitoring report are provided to the other federal property owners.

NHPA Section 110 cultural resource inventories are conducted as a proactive means for agencies to identify cultural resources that are NRHP eligible. PNSO has completed cultural resource inventories of all of the federally owned portions of the PNNL Site

4.2.2 Protective Measures for Culturally Sensitive Areas

Protection of culturally sensitive resources and areas on the PNNL Site is accomplished by regular monitoring of specific projects, annual archaeological monitoring, PNNL security staff, and limiting access. The sensitive resources are monitored annually as part of the NHPA Section 110 compliance process described above.

Access to culturally sensitive areas on the PNNL Site is controlled via several methods, including signage and physical barriers. The main barriers to access these sites are locked cables and physical barriers that limit vehicle access to the roads that enter the sensitive area. Administrative control of the sensitive area is maintained using the following controls:

- keyed locks for cable barriers across the access roads
- frequent security checks of road barriers
- control of keys released to PNNL and other DOE contractor staff that may require access to the transport route
- mandatory briefing for all key requesters on the cultural sensitivity of the area before issuance of keys
- required reporting of all gate entry and access duration to PNNL Operations and Security.

4.3 Cultural Resource Facilities, Records, and Documentation

PNNL cultural resource facilities include a secure records-holding area, computerized databases, and a GIS. PNSO currently maintains no collections and has no plans to maintain collections. If the need for collection and curation occurs in the future, PNSO and PNNL will coordinate with local facilities, such as Washington State University–Tri-Cities, to investigate arrangements for secure storage and curation. The types of records and data stored include site forms, environmental data, excavation forms, maps, correspondence, field notebooks, written reports, and photographs. Much of the cultural resource information for the PNNL Site is archived electronically.

PNSO follows DAHP guidance for documentation standards. Cultural resource reports follow the Washington State Standards for Cultural Resource Reporting. DAHP provides three types of inventory forms to document cultural resources in the state of Washington. Archaeological resources are documented using the Washington State Department of Archaeology *Site Form* or *Isolate Inventory Form*. Components of the built environment such as buildings and structures are documented using the *DAHP Historic Property Inventory Database*.

5.0 Biological Resource Compliance and Management

PNNL research projects are conducted both on the PNNL Site and on numerous other federal sites and many non-federally owned sites and facilities throughout the United States. In addition, federal funds may be used to operate, maintain, and modify non-DOE-owned facilities in support of PNNL research projects. Compliance with certain laws and regulations, such as *Endangered Species Act (ESA)* Section 7 is required whenever an action occurs on federal land, uses federal funding, or requires a federal permit or license. Therefore, work and projects conducted by PNNL at any location must comply with federal and state regulations regarding biological resources. Research projects conducted at other government or private facilities will also comply with management plans or requirements specific to those sites. For research activities conducted at other government or private facilities, PNSO will coordinate with the host and/or funding agency to identify the appropriate lead agency for NEPA and ESA Section 7.

5.1 Biological Resource Compliance

This section identifies and describes the organization, requirements, and mechanisms used to assess and manage impacts on biological resources that may result from PNNL-related activities either on the PNNL Site or at other locations. The numerous applicable requirements for the evaluation of ecological resource impacts are summarized in Appendix A. The PNSO biological compliance implementation process is focused on the ESA and *Migratory Bird Treaty Act (MBTA)*, but the process also provides compliance assurance for the other pertinent laws, regulations, and Orders. Projects that occur in more specialized locations such as wetlands, the Columbia River, or the ocean, often require additional consideration under the *Clean Water Act*, *Magnuson-Stevens Fisheries Conservation and Management Act*, or *Marine Mammal Protection Act*. The applicability of other laws, regulations, and Orders is considered for each action.

Pertinent regulations that implement applicable laws include those promulgated by the regulatory agencies that are responsible for their enforcement, as well as guidelines promulgated by DOE defining DOE responsibilities under NEPA (10 CFR Part 1021), wetlands and floodplain protection (10 CFR Part 1022), and other Executive and DOE Orders. Analyses of the ecological effects of federal actions are generally implemented through compliance with NEPA. In addition to federal regulations, resource reviews must consider the Washington State laws and county or local requirements that pertain to the protection of biological resources.

5.1.1 Biological Compliance Assessment

All PNNL projects and actions are reviewed to assess potential impacts on the ecological resources. Actions that require a Biological Resource Review (BRR) are normally identified as part of PNNL's formal NEPA implementation program, including the Electronic Prep and Risk evaluations, and the review of facilities and operations maintenance planned work and facility modification permits. The PNNL workflow management system contains required steps for obtaining the necessary formal reviews and approvals for NEPA analysis including the conduct of BRRs.

The objectives of conducting BRRs for project activities include the following:

- Assess and document the potential for proposed projects to affect biological resources of concern.
- Provide guidance and recommendations to minimize or avoid impacts where possible.

- Retain the documentation in a format that can be reviewed by PNSO or stakeholders.

PNNL ecological SMEs use the results of the field surveys to evaluate the potential impacts of proposed projects on species or habitats of concern. Impacts on species of concern are assumed to arise primarily from direct mortality, habitat loss (reproductive, cover/roosting, foraging habitat), nest or den destruction, or disturbance during nesting/reproduction/foraging (e.g., visual or noise impacts causing disruption of nesting). To be useful, field data must be obtained at the biologically appropriate times of year (i.e., the period when the species of concern can be expected to be present and in an identifiable condition).

Findings of the BRR are documented in letter reports and provided to the project manager/review requestor. The contents of the BRR reports will vary according to the type of action under review and the scale and scope of the potential impacts. All BRR letter reports contain the action title and description, the assigned action number (e.g., 2013-PNSO-010), the objectives of the review, and the findings. BRRs are intended to help PNSO and its contractors manage impacts on species and habitats of concern. Assistance is provided through the collection and dissemination of information about project-specific impacts on biological resources, consultation with project managers to make planning decisions, identification of mitigation requirements, and options for avoiding or minimizing impacts.

5.1.2 Impact Management and Mitigation

The BRR process incorporates both impact assessment (evaluation of potential impacts before they occur) and impact management (mitigation of adverse impacts). Although adverse impacts on biological resources cannot always be eliminated, they can often be reduced or minimized via consideration during the early phases of project development and decision making. BRRs allow project managers, during the early phases of projects, to develop approaches that will avoid and/or minimize adverse impacts on ecological resources. Project impacts can be avoided or minimized by taking steps such as the following:

- Implement alternatives that would result in fewer adverse impacts.
- Locate projects at a less ecologically sensitive site.
- Reduce or move the project footprint or reduce land-use requirements.
- Schedule project activities so that disruption of key species and functions is minimized.

Mitigation is a series of prioritized actions that, taken together, reduce or eliminate adverse project impacts on biological resources. Mitigation actions that rely on changes in project timing or location to avoid or minimize impacts are considered part the ecological compliance review process. Mitigation actions that rely on replacement or improvement of habitat are part of the broader strategy for biological resources mitigation. When impacts cannot be reasonably avoided or minimized, a BRR will identify potential subsequent mitigation requirements involving onsite and/or offsite habitat improvements.

5.1.3 Migratory Bird Protection

Migratory birds, as well as their nests and eggs, are protected under MBTA. DOE has additional responsibilities regarding migratory bird protection via Executive Order 13186, “Responsibilities of Federal Agencies to Protect Migratory Birds,” and the Memorandum of Understanding developed with the U.S. Fish and Wildlife Service (USFWS) related to this Executive Order (DOE and USFWS 2013).

Migratory bird protection is partially covered via BRRs for all field research and facility maintenance activities. The BRR field surveys include specific evaluations of the presence of and potential impacts on

migratory birds, and the project scope, location, or timing may be adjusted as needed to protect nesting migratory birds. In some instances, the BRR will identify additional measures that should be taken, such as installation of bird-exclusion devices to prevent nesting in areas where disturbance is likely. In addition, the BRR may identify areas with high potential for continued nesting; these areas are then monitored regularly throughout the nesting season to determine whether personnel exclusion or other management actions are required such as installation of nest-exclusion devices.

PNNL has developed an active communications program to educate staff about the need for and importance of migratory bird protection. This program has resulted in a notable increase in staff awareness, which results in numerous reports of bird nests independent of the normal BRR process. When nests are identified in areas where disturbance is likely, the site is posted to keep staff away from the site, and the nest is monitored to determine when normal activities can resume in the area.

5.1.4 Agency Consultation on Biological Resources

Coordination and consultation with federal and Washington State resource management agencies regarding impact assessment and management are integral to successful resource management and protection. Under the ESA, consultation with the USFWS or the National Marine Fisheries Service (NMFS) is required if an action may affect a listed species or critical habitat. Procedures for coordination and consultation with these and other agencies follow those outlined by the agencies and by DOE through its regulations on interagency consultation and cooperation. Consultations are initiated as required under the ESA and as needed to facilitate impact analyses and to define mitigation needs. For some aquatic projects, consultation with NMFS under the *Magnuson-Stevens Fisheries Conservation and Management Act* and *Marine Mammal Protection Act* may be needed.

5.2 Biological Resource Management on the PNNL Site

Natural resource management on the PNNL Site is tailored to implement resource management responsibilities and stewardship to maintain ecosystem integrity while providing for sustainable development in support of present and future PNSO mission requirements. The management approach for PNSO-owned lands considers both the long-term sustainability of ecosystem services as well as the social and economic viability of functioning ecological systems and supports the management actions through effective partnerships among private, local, state, tribal, and federal interests. Natural resource management considers the environment as a complex system functioning as a whole, not as a collection of parts, and recognizes that people and their social and economic needs are a part of the whole. Management of biological resources on the PNNL Site is focused to implement the following:

- a multiple species management approach that is consistent with the requirements of the ESA and avoids single-species management
- an adaptive-management approach to manage threats to natural resources
- the best available scientific information in decision-making and adaptive-management techniques.

This approach includes three key elements: 1) resource monitoring for status and trends, 2) impact assessment and management, and 3) focused resource improvement.

5.2.1 Inventory and Survey of Biological Resources

Effective resource management requires current information about the location, status, and condition of the species and habitats that exist within the management areas. Protection and conservation of species

of concern and their habitats on the PNNL Site is a primary goal of biological resource management. Achieving species and habitat management goals requires that up-to-date information be maintained to describe the species inhabiting the area, as well as the legal and conservation status of those species and their habitats with respect to federal and state agency regulations and requirements.

Staff at PNNL survey and monitor biological resources each year to provide up-to-date information regarding the presence or absence of species of concern, and to identify and map invasive and noxious species' occurrence. Resources of concern include those categories of species or their habitats identified under the DOE NEPA implementing procedures in 10 CFR Part 1021 (such as federally or state endangered or threatened species) as well as Washington State candidate, sensitive, and monitor species. In addition to rare species and their habitats, other biological resources of concern include migratory birds, floodplains, wetlands, essential fish habitat, and Washington State priority habitats.

Field methods used during the annual surveys include pedestrian surveys by qualified biologists during the appropriate season to detect species or habitat features of interest. The annual surveys are intended to identify additional species of concern that occur onsite, monitor the status or condition of previously known resources, and identify whether any resource degradation is occurring. Initial inventories of biological resources have been conducted at the PNNL Site. As part of the inventories, habitats and significant features have been mapped (Figure 3.1).

5.2.2 Noxious Weed Management

Noxious weed control and eradication is required by both Washington State (RCW 17.10) and through directives in Executive Order 13112, "Invasive Species." Annual surveys of the PNNL Site include collection of data to document the occurrence and spatial extent of Class A, Class B, and Class C noxious weeds listed by the state of Washington (WAC 16-750). These surveys provide the information necessary to develop and implement control efforts, including spot-spraying weeds with herbicides during the appropriate season and growth stage and the use of certified biological controls for specific species.

Staff at PNNL have worked to control Class B noxious weeds on the PNNL Site, including diffuse knapweed (*Centaurea diffusa*), rush skeletonweed (*Chondrilla juncea*), yellow star-thistle (*Centaurea solstitialis*), and Russian knapweed (*Acroptilon repens*). Tree-of-heaven (*Ailanthus altissima*) was found to occur in a small clump along the Columbia River in 2012. This species was added to the Class C noxious weed list in 2012. Control of this species is not required at the county level, but is strongly recommended.

5.3 Biological Resource Facilities, Records, and Documentation

Effective biological resource management requires accurate and reliable collection and storage of information about the status and condition of species and habitats as well as the methods and procedures for retaining records related to compliance reviews, consultation, and environmental assessments. This section describes the assets and capabilities available for conducting biological surveys, and the process for maintaining the information required for effective resource management.

Biological resource facilities available as part of the technical support from PNNL include the following:

- voucher collections of plants and wildlife
- computerized databases and GIS documenting species occurrence and habitat distribution on lands and facilities under PNSO stewardship

- survey equipment, including Global Positioning System receivers and software, binoculars, and cameras
- laboratory facilities for preservation of biological materials and vouchers.

Biological resource records include results of annual inventory and monitoring surveys, data collected during ecological compliance reviews, maps and supporting data, BRR letters, other written reports and assessments, and documentation of consultation with federal or state agencies. Information about important species and habitats collected during annual inventory and monitoring surveys and ecological compliance assessment reviews is spatially referenced and archived in a biological resource data base, including a GIS and database files, for retrieval, review, and reporting.

Species protected by federal regulations are identified and updated in the *Federal Register* and other agency publications on a regular basis. Species listed under the ESA as threatened or endangered, or candidates for such listing, are published in 50 CFR Part 17, “Endangered and Threatened Wildlife and Plants.” A list of migratory birds covered by the MBTA is maintained at 50 CFR 10.13. The USFWS and the NMFS also maintain web sites with up-to-date information about species and habitats of concern, including wetlands, that potentially occur on lands and at facilities under PNSO stewardship. Wetlands delineation and permitting procedures under the *Clean Water Act* are published by the USACE (33 CFR Parts 320–330).

Species and habitats protected by Washington State laws, regulations, or guidance are published by the WDFW and Washington Department of Natural Resources (WDNR). PNNL ecological SMEs regularly review these agencies publications and websites to maintain current knowledge of species listing and status. The information is retained in the program files and is updated as changes in listings are made publicly available by the listing agencies.

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Appendix A

Applicable Guidance and Requirements for Protection of Cultural and Biological Resources

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Appendix A

Applicable Guidance and Requirements for Protection of Cultural and Biological Resources

A.1 Requirements for Cultural Resources

Applicable requirements for evaluation of cultural resource impacts include the following federal laws:

- *National Historic Preservation Act of 1966*
- *Historic Sites Act of 1935*
- *National Environmental Policy Act of 1969*
- *Archaeological and Historic Preservation Act of 1974*
- *Archaeological Resources Protection Act of 1979*
- *Native American Graves Protection and Repatriation Act of 1990*
- Executive Order 11593, “Protection and Enhancement of the Cultural Environment”
- Executive Order 13007, “Indian Sacred Sites”
- Executive Order 13175, “Consultation and Coordination with Indian Tribal Governments”
- Executive Order 13287, “Preserve America.”

National Historic Preservation Act of 1966 (16 United States Code [USC] 470)

For federal agencies, the most important regulation governing the management of cultural resources is the *National Historic Preservation Act of 1966* as amended (NHPA). The NHPA and its amendments, establish historic preservation as a national policy and defines it as the protection, rehabilitation, restoration, and reconstruction of districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, or engineering. The NHPA also expands the National Register of Historic Places (NRHP) (36 CFR Part 60) to include resources of state and local significance, and establishes the Advisory Council on Historic Preservation (Council) as an independent federal agency. The NHPA Amendments of 1980 and 1992 direct the Secretary of the Interior to establish guidelines for nationally significant properties, curation of artifacts, documentation of historic properties, and preservation of federally owned historic sites. They also require designation of a Federal Historic Preservation Officer (FHPO) in each federal agency, authorize the inclusion of historic preservation costs, and authorize the withholding of sensitive data on historic properties when necessary. Section 110 of the NHPA requires federal agencies to identify, evaluate, and nominate historic properties under agency control to the NRHP. Section 110 also requires federal agencies to preserve and use historic buildings “to the maximum extent feasible,” and to have in place Section 106 compliance procedures. Consultation with other federal, state, and local agencies, as well as Native Hawaiian/Alaskan organizations, American Indian Tribes, and other “private individuals” regarding these activities is also required when appropriate.

Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties, and allows the Council a reasonable opportunity to comment on proposed undertakings that could affect historic properties. It also outlines legislative requirements and review processes that federal agencies are expected to use when considering the effects of proposed undertakings on historic properties listed, or eligible for listing, in the NRHP.

Historic Sites Act of 1935 (16 USC 461-467)

When enacted, the primary goal of the *Historic Sites Act of 1935*, as amended (HSA) was to provide for the establishment and maintenance of historic sites. Furthermore, the HSA was enacted to provide for the preservation of historic buildings, sites, objects, and antiquities of national significance. It also provides a list of specific National Historic Sites. The Secretary of the Interior, through the National Park Service, has the authority to secure data relating to historic and archaeological sites; make surveys of sites and buildings to determine those that are significant to the United States; acquire, reconstruct, and manage historic properties; and develop educational programs to inform the public of historic and prehistoric sites. In addition, the National Park Service administers the National Historic Landmarks Program on behalf of the Secretary of the Interior.

National Environmental Policy Act of 1969 (42 USC 4321)

The *National Environmental Policy Act of 1969*, as amended (NEPA) requires all federal agencies to consider the environmental impacts of their projects as part of the federal planning process. For major federal actions, federal agencies are required to prepare an environmental impact statement that includes possible impacts of the project on archaeological and historic properties and natural resources. The Department of the Interior, Advisory Council on Historic Preservation, and appropriate federal, state, and local agencies, may be consulted during the process.

Archaeological and Historic Preservation Act of 1974 (16 USC 469)

The *Archaeological and Historic Preservation Act of 1974*, as amended (AHPA) requires preservation of significant historic and archaeological data affected by any federal or federally related land modification activity. The AHPA authorizes the expenditure of up to 1 percent of project costs to be allocated to archaeological survey and data recovery within the project area.

Archaeological Resources Protection Act of 1979 (16 USC 470aa-47011)

The *Archaeological Resources Protection Act* of 1979, as amended (ARPA) protects archaeological resources on public and Native American lands and incorporates most provisions of the Antiquities Act of 1906. The ARPA establishes a permit application procedure for the excavation and removal of archaeological resources located on these lands, and provides for criminal penalties for the excavation, removal, damage, sale, exchange, purchase, or transportation of these archaeological materials unless such activity is carried out under a permit issued by the authority of the Act. It also considerably strengthens preservation and archaeological protection by instituting civil and criminal penalties for illegal use and destruction of resources on sites on public and Native American lands. Amendments added in 1988 strengthened the original Act by lowering the limit of the felony violation of the Act to \$500 worth of damage to archaeological sites, and prohibiting the attempt to damage a site. These Amendments also require federal agencies to develop public awareness programs, and to improve communication and the exchange of information between all interested parties for more effective preservation efforts.

Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001)

The *Native American Graves Protection and Repatriation Act of 1990, as amended* (NAGPRA) describes the rights of Native American lineal descendants, Indian Tribes, and Native Hawaiian organizations with regard to human remains, funerary objects, sacred objects, and objects of cultural patrimony with which they can demonstrate lineal descent or cultural affiliation. The NAGPRA affirms the right of such individuals or groups to decide disposition or take possession of such items. It also requires each federal agency and museum receiving federal funding to inventory human remains and associated funerary objects, and to provide culturally affiliated Tribes with the inventory and a summary of its collections of other cultural items. A Tribe having cultural affiliation may request repatriation of human remains and funerary objects. The NAGPRA also protects Native American burial sites and controls the removal of human remains, funerary objects, sacred objects, and items of cultural patrimony on federal and tribal lands. It also provides for criminal penalties in the event of illegal trafficking in human remains and cultural items.

Protection and Enhancement of the Cultural Environment (Executive Order 11593)

The Executive Order for Protection and Enhancement of the Cultural Environment requires federal agencies to inventory their cultural resources and establish policies and procedures to assure the protection, restoration, and maintenance of any sites, structures, or objects of historical, architectural, or archaeological significance are preserved, restored, and maintained.

Indian Sacred Sites (Executive Order 13007)

This Executive Order directs federal agencies to accommodate access to and ceremonial use of Indian sacred sites and to avoid adversely affecting the physical integrity of these sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.

Consultation and Coordination with Indian Tribal Governments (Executive Order 13175)

This Executive Order directs federal agencies to develop a process to assure meaningful tribal input when developing regulatory policies that have tribal implications and to consult with tribal authorities.

Preserve America (Executive Order 13287)

This Executive Order directs federal agencies to increase their knowledge of historic resources in their care, enhance the management of these assets, and to seek partnerships with state, tribal, and local governments to make more informed and efficient use of those resources.

A.2 Requirements for Biological Resources

Applicable requirements for evaluation of biological resource impacts include the following federal laws and Executive Orders:

- *Endangered Species Act of 1973*
- *National Environmental Policy Act of 1969*
- *Migratory Bird Treaty Act of 1918*
- *Bald and Golden Eagle Protection Act*
- *Marine Mammal Protection Act of 1972*

- *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
- *Resource Conservation and Recovery Act of 1976*
- *Clean Water Act*
- *Sikes Act*
- *Magnuson-Stevens Fishery Conservation and Management Act*
- *Coastal Zone Management Act of 1972*
- *Rivers and Harbors Act of 1899*
- Executive Order 13112, “Invasive Species”
- Executive Order 13186, “Responsibility of Federal Agencies to Protect Migratory Birds”
- Executive Order 11990, “Protection of Wetlands”
- Executive Order 11988, “Floodplain Management.”

Pertinent regulations that implement these laws include those promulgated by the regulatory agencies with responsibility for their enforcement, as well as guidelines promulgated by the DOE defining its responsibilities under NEPA (10 CFR Part 1021) and other federal Executive Orders and DOE Orders. The key factors of these laws as they apply to the biological resource review process are described briefly here.

Endangered Species Act (16 USC 1531 et seq.)

The *Endangered Species Act of 1973*, as amended (ESA) provides for the designation and protection of wildlife, fish, and plant species that are in danger of becoming extinct because of natural or human-made factors and the conservation of the ecosystems upon which they depend. Under Section 7 of the ESA, federal agencies are required to evaluate actions that they perform, fund, or permit, to determine whether any species listed as endangered or threatened at 50 CFR 17.11 and 50 CFR 17.12 may be affected by the proposed action. Consultation with the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) is required if the action may affect a listed species. The biological resource review process is the primary means by which DOE determines if any listed species may be affected by a proposed action.

National Environmental Policy Act (42 USC 4321 et seq.)

As stated in the implementing regulations of the NEPA, “The NEPA process is intended to help public officials make decisions that are based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment” (40 CFR 1500.1c).

Executive Order 11514, “Protection and Enhancement of Environmental Quality,” and Executive Order 11991, “Relating to Protection and Enhancement of Environmental Quality,” further define the role of federal agencies in implementing NEPA. Executive Order 11514 establishes that federal agencies shall “...monitor, evaluate, and control on a continuing basis their agencies’ activities so as to protect and enhance the quality of the environment. Such activities shall include those directed to controlling pollution and enhancing the environment and those designed to accomplish other program objectives which may affect the quality of the environment.” Executive Order 11991 requires federal agencies to

“...comply with the [NEPA] regulations issued by the Council [on Environmental Quality] except where such compliance would be inconsistent with statutory requirements.”

Proper application of the NEPA process requires a thorough understanding of the resources present, the potential impacts on those resources of a proposed action, and the ultimate consequences of those actions. Biological resources are one of many resource areas considered under the NEPA, and the biological resource review process provides the basic biological information needed to determine whether adverse impacts on biological resources may occur as a result of a proposed project and, thus, provides important information directly to the NEPA decision-making process. The process helps to assure that a proposed action meets the basic assumptions of no adverse impacts underlying a categorical exclusion if a more comprehensive NEPA analysis is not planned.

Migratory Bird Treaty Act (16 USC 703-712)

The *Migratory Bird Treaty Act of 1918*, as amended (MBTA) makes it illegal to take, capture, or kill any migratory bird, or to take any part, nest, or egg of any such birds, included in the terms of the conventions (covered species are listed at 50 CFR 10.13). The biological resource review process aids in compliance with the MBTA by identifying species that are present and thus could be affected by a proposed action at a specific site.

Bald and Golden Eagle Protection Act (16 USC 668 et seq.)

The *Bald and Golden Eagle Protection Act* makes it illegal to take (i.e., pursue, wound, kill, molest, or disturb), as applicable, any bald or golden eagle, or any part, nest, or egg of these eagles. The biological resource review process provides assurance that a proposed action will not adversely affect bald or golden eagles.

Marine Mammal Protection Act (16 USC 1361 et seq.)

The *Marine Mammal Protection Act of 1972*, as amended prohibits, with certain exceptions, the take (i.e., hunting, killing, capture, and/or harassment) of any marine mammal in U.S. waters and by U.S. citizens on the high seas, and enacts a moratorium on the import, export or sale of marine mammals, and marine mammal products or parts within the United States.

Comprehensive Environmental Response, Compensation, and Liability Act (42 USC 9601 et seq.)

The primary purpose of the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, as amended (CERCLA or Super Fund) is to provide for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment, as well as the cleanup of inactive hazardous waste disposal sites.

Section 107(f) of CERCLA identifies and defines natural resource trustees. Trustees are authorized to act in the public interest in regard to natural resources. The CERCLA process requires evaluation of natural resources, including biological resources, on the site and in the area potentially affected by the release. The biological resource review process is the means by which resources that may be injured by a cleanup action are identified; the evaluation of injuries due to contaminant release will likely be performed separately. In addition, the CERCLA planning and evaluation process can be used in place of a NEPA evaluation; in those cases, the Biological Resources Review (BRR) supports the CERCLA process in the same way that it would support a NEPA review.

Resource Conservation and Recovery Act (42 USC 6901 et seq. and 42 USC 6927(c) et seq.)

The primary purpose of the *Resource Conservation and Recovery Act of 1976*, as amended (RCRA) is to assure the safe and environmentally acceptable management of solid wastes. RCRA outlines the framework of national programs conducted to achieve environmentally sound management of both hazardous and non-hazardous wastes. Waste site operation activities and RCRA compliance activities may have significant adverse impacts on biota. RCRA activities must comply with other federal statutes that do not deal directly with control and abatement of solid waste or hazardous waste disposal—for example, NHPA and ESA. The BRR process provides data in direct support of RCRA permits and helps to assure that RCRA activities are not adversely affecting biota and that these activities are in compliance with other applicable laws.

Clean Water Act (33 USC 1251-1387)

Section 404 (b)(1) of the *Clean Water Act (CWA)* authorizes the U.S. Army Corps of Engineers (USACE) to issue permits for the discharge into or dredging of wetlands (33 CFR Parts 320-330 et seq.). The U.S. Environmental Protection Agency guidelines (40 CFR Part 230) require that potential impacts on physical, chemical, and biological characteristics of the aquatic systems be considered in the permit process. The BRR process allows DOE to determine whether any wetlands may be affected by a proposed action.

Sikes Act (16 USC 670a-670o)

The *Sikes Act* (Public Law 86-797) originally provided for cooperation by the U.S. Department of the Interior and the U.S. Department of Defense with state agencies in “planning, development, maintenance and coordination of wildlife, fish and game conservation and rehabilitation” on military reservations throughout the United States. An amendment (Public Law 93-452) in 1974 authorized conservation and rehabilitation programs on lands managed by DOE, National Aeronautics and Space Administration, U.S. Forest Service, and Bureau of Land Management. These programs are carried out in cooperation with the states by the Secretary of the Interior. Information required to support effective interagency cooperation is obtained, in part, via the BRR process.

Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801-1884)

Federal agencies are obligated, under Section 305(b)(2) of the *Magnuson-Stevens Fishery Conservation and Management Act (MSA)* and its implementing regulations (50 CFR Part 600, Subpart K), to consult with the NMFS regarding actions that are authorized, funded, or undertaken by those agencies, that may adversely affect essential fish habitat (EFH). The MSA defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The purpose of the procedures is to promote the protection of EFH in the review of federal and state actions that may adversely affect EFH. Activities in or near the Columbia River may affect EFH for anadromous salmonids and activities at ocean sites may affect EFH for salmonids and other managed species. The BRR process helps to identify EFH resources and contributes to the evaluation of impacts on EFH.

Coastal Zone Management Act (16 USC 1451-1464)

The *Coastal Zone Management Act of 1972*, as amended, encourages coastal states and Tribes to develop coastal zone management plans to preserve, protect, develop, and where possible restore or enhance natural coastal resources such as wetlands, floodplains, estuaries, beaches, and dunes as well as the fish and wildlife using those habitats. The 1990 reauthorization asks that approved management programs be revised to include coastal nonpoint pollution control programs. In Washington State this is

implemented via the *Shoreline Management Act of 1971* (RCW 90.58), and local-level shoreline master programs.

Rivers and Harbors Act (33 USC 403)

Section 10 of the *Rivers and Harbors Appropriation Act of 1899*, as amended, prohibits obstruction of any navigable waters of the United States by structures (e.g., piers, breakwaters or dams) unless authorized by the USACE. It also prohibits excavating, filling or any other means of altering navigable waters, including the discharge of refuse of any kind, unless authorized by the USACE.

Invasive Species (Executive Order 13112)

Executive Order 13112, “Invasive Species,” requires all executive agencies to identify actions that may affect the status of invasive species; prevent the introduction of such species; detect, monitor, and control populations of invasive species; restore native species and habitats that have been invaded; and conduct research on the prevention and control of invasive species. In addition, executive agencies are prohibited from authorizing or funding activities that are likely to cause or promote the introduction or spread of invasive species (unless the benefit of such an action clearly outweighs the potential harm from the invasive species). The BRR process provides information about the locations of invasive species populations and helps to identify situations that lead to the establishment or spread of invasive species.

Responsibility of Federal Agencies to Protect Migratory Birds (Executive Order 13186)

Executive Order 13186, “Responsibility of Federal Agencies to Protect Migratory Birds,” further clarifies federal agency responsibilities under the MBTA and other regulations by requiring, among other things, that they “identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors.” The biological resource review process is the primary means by which DOE is able to determine whether unintentional take is likely and the potential effects of such take. Also requires agencies to develop Memoranda of Understanding with USFWS regarding the conservation, protection, and management of migratory birds on lands the agencies manage. DOE signed a revised Memorandum of Understanding with USFWS in 2013 (DOE and USFWS 2013)

Protection of Wetlands (Executive Order 11988); Floodplain Management (Executive Order 11990)

Executive Order 11990, “Protection of Wetlands,” and Executive Order 11988, “Floodplain Management,” require federal agencies to minimize the loss or degradation of wetlands on federal lands and account for floodplain management when developing water- and land-use plans, respectively. The DOE implements the requirements of these two Executive Orders via 10 CFR Part 1022, “Compliance with Floodplain and Wetlands Environmental Review Requirements.” It is DOE policy to 1) restore and preserve natural and beneficial values served by floodplains; 2) minimize the destruction, loss, or degradation of wetlands; and 3) preserve and enhance the natural and beneficial value of wetlands. As with the wetland provisions of the CWA, the biological resource review process helps to identify wetlands and floodplains within a proposed project area and helps to identify the impacts of the proposed action to those wetlands and floodplains.

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