PNSO-PLAN-09
Revision 4

PACIFIC NORTHWEST SITE OFFICE CULTURAL AND BIOLOGICAL RESOURCES MANAGEMENT PLAN

November 2021

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Roger E. Snyder

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Approval Date

Roger E. Snyder,
PNSO Site Office Manager

U.S. DEPARTMENT OF ENERGY | PACIFIC NORTHWEST SITE OFFICE

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," DOE Order 144.1, "Department of Energy American Indian Tribal Government Interactions and Policy," DOE Order 436.1, "Departmental Sustainability," and 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 cultural and biological resources on the Pacific Northwest National Laboratory (PNNL) Campus located in Richland, Washington, and for work that occurs offsite. 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 activities.

In addition to directing the implementation of management strategies and administration related to resources on PNSO lands, the CBRMP will help assure that all research activities under PNSO oversight and federally funded PNNL facility maintenance actions comply 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 cultural and biological resources of PNSO-managed lands in an ecoregional and historical 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	*Archaeological and Historic Preservation Act of 1974*
AIRFA	*American Indian Religious Freedom Act*
APE	area of potential effect
ARPA	*Archaeological Resources Protection Act of 1979*
BRR	biological resources review
CBRMP	Cultural and Biological Resources Management Plan
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	*Code of Federal Regulations*
CRR	cultural resources review
CSF	Computer Sciences Facility
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
CWA	*Clean Water Act*
DAHP	Washington State Department of Archaeology and Historic Preservation
DOE	U.S. Department of Energy
EFH	essential fish habitat
EM	(DOE) Office of Environmental Management
EMSL	William R. Wiley Environmental Molecular Science Laboratory
ESA	*Endangered Species Act of 1973*
GIS	geographic information system
ha	hectare(s)
HSA	*Historic Sites Act of 1935*, as amended
MBTA	*Migratory Bird Treaty Act of 1918*
MSA	*Magnuson-Stevens Fishery Conservation and Management Act*
NAGPRA	*Native American Graves Protection and Repatriation Act*
NEPA	*National Environmental Policy Act of 1969*
NHPA	*National Historic Preservation Act of 1966*
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
PNNL	Pacific Northwest National Laboratory
PNSO	(DOE) Pacific Northwest Site Office
POC	point of contact
PSF	Physical Sciences Facility
RCRA	*Resource Conservation and Recovery Act of 1976*
RCW	Revised Code of Washington
RL	(DOE) Richland Operations Office
SHPO	State Historic Preservation Officer (or Office)

SME	subject matter expert
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
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 *National Historic Preservation Act of 1966* (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 *National Environmental Policy Act of 1969* (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. Consultation can occur at the government-to-government level between DOE and the responsible state or federal agency (State Historic Preservation Officer and/or Advisory Council on Historic Preservation for cultural resources, the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service for biological resources) and tribal governments or at the technical level between DOE and agency/tribal staff. Other government agencies and interested parties may be involved in the consultation.
consulting party	The following parties have consultative roles in the Section 106 process, as defined at 36 CFR 800.2(c): The State Historic Preservation Officer, Tribal Historic Preservation Officer, Indian tribes and Native Hawaiian organizations, local governments and interested parties.
cultural resources	A collective term applicable to 1) prehistoric and historic archaeological sites and artifacts designating past land use; 2) historic buildings and/or structures; 3) landscapes, sites, plants, and animals of traditional and cultural value to the Native American and non-Native American communities

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 are used by public and private agencies and organizations to develop management plans based on 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 (NHPA Section 110).

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. *Eligible for inclusion in the National Register* 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 party	An organization and/or individual 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	For cultural resources, mitigation consists of the resolution of adverse effects on historic properties by 1) avoiding the impact altogether, 2) minimizing the impact, or 3) if adverse effects cannot be avoided or minimized, they can be resolved through the creation of a Memorandum of Agreement. For biological resources, 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 persisting 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 Richland Campus	Approximately 269 ha (664 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 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.
Section 106	Section of the *National Historic Preservation Act* which requires federal agencies to consider potential effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.
Section 110	Section of the *National Historic Preservation Act* which requires land managing federal agencies to establish historic preservation programs to protect and preserve historic properties.
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).

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 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 NHPA 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. *Stewardship responsibility* 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 an area. Tribes that have identified such an attachment on the PNNL Richland Campus 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.

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 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 Resources 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 tribal 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 ten National Laboratories overseen by the DOE Office of Science (SC), PNNL is operated under contract by Battelle Memorial Institute (Battelle).

While the CRMP covers all activities under PNSO's purview, specific attention will be paid to the PNNL Richland Campus. The PNNL Richland Campus 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). It is bounded to the west by Stevens Drive and on the east by the Columbia River. The PNNL Richland Campus consists of 269 ha (664 ac) of developed and undeveloped lands.

1.1 CBRMP Purpose

DOE land and facilities are considered valuable national resources, and DOE Orders direct that land-use planning and stewardship responsibilities be implemented in a manner consistent with the principles of ecosystem management and sustainable development (DOE O 430.1b). The purpose of the PNSO CBRMP is to identify the management strategies and actions that are taken to assure that 1) important cultural and biological resources under PNSO stewardship are protected and 2) all PNNL operations and research activities comply with applicable environmental, biological, and cultural regulations and laws. The CBRMP is prepared to meet the requirements of DOE Policy 141.1, "Department of Energy Management of Cultural Resources," and DOE Order 144.1, "Department of Energy American Indian Tribal Government Interactions and Policy and to follow the direction relative to cultural and biological resources within DOE Orders 436.1, "Departmental Sustainability," and 430.1b, "Real Property and Asset Management."

PNSO understands the importance of the cultural and biological resources to all consulting parties, such as tribes, interested parties and 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, tribal treaties, 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 cultural and biological resources on the PNNL Richland Campus 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 personnel and public use.

1.2 Scope of the CBRMP

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 PNNL Richland Campus and at other locations.

Direct management of cultural and biological resources (for instance, weed control or archaeological site monitoring) is part of PNSO's stewardship responsibility for PNSO-owned land that constitutes the PNNL Richland Campus. 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 tribal treaties at all locations where these activities occur. The regulatory compliance procedures described in Sections 4 and 5 of this CBRMP apply at all locations where these activities occur, including all federally and non-federally owned sites.

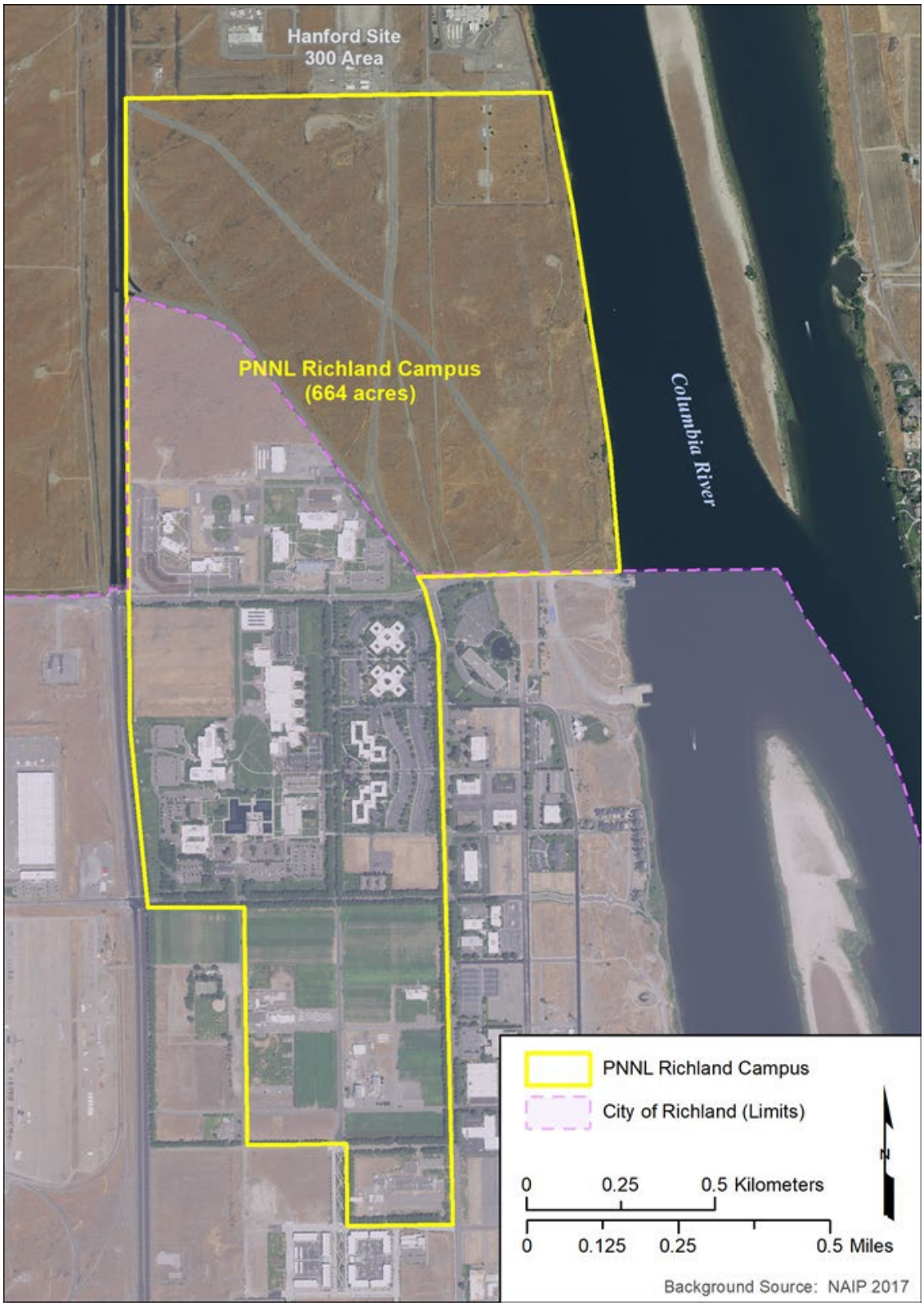

Figure 1.1. PNNL Richland Campus and Surrounding Area

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. The resources under PNSO control are managed 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 whenever practical, consistent with PNSO's mission.
- 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 cultural and biological resources.
- Coordinate and consult with other governmental agencies; consulting parties, including the State Historic Preservation Officer (SHPO) and Native American tribes; interested parties; and members of the public, as applicable, on cultural and biological resource management issues in an open and cooperative manner.
- Protect cultural resources using an approach consistent with the Department of the Interior's National Strategy for Federal Archeology (USDOI 1999).
- Promote outreach with Native American tribes to assure their access to cultural and biological resources and verify their 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, DOE Orders, and DOE Policies.
- Achieve compliance with laws, regulations, Executive Orders, and DOE directives related to cultural and biological resources.
- Integrate cultural and biological 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 cultural and biological 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 PNSO Operations Division has the lead for assuring compliance with this plan, DOE policy, and applicable requirements (see Appendix A). Responsibility for maintaining the CBRMP current is held by the PNSO employee with oversight responsibility of the PNNL Cultural Resources Program and the PNNL Biological Resources Program. PNSO receives support as needed from other DOE elements such as, but not limited to; the SC Consolidated Support Center (CSC), DOE Federal Preservation Officer (FPO), other DOE offices, etc. Staff at PNNL provides technical support for resource identification, review and compliance, protection, mitigation, and reporting. As per DOE Policy 141.1, "Department of Energy Management of Cultural Resources," 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.

National Historic Preservation Act (NHPA) Section 106 reviews are required for all federal undertakings, i.e. 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. Biological resources reviews (BRRs) 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 Richland Campus

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

3.1 PNNL Richland Campus Environmental Setting

The PNNL Richland Campus 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 Richland Campus are primarily sands to sandy loams.

In general, the unconfined water table is found in the Ringold Formation at a depth of 30 to 62 ft (10 to 20 m) 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 mi [3 km] south of the PNNL Richland Campus) 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 Richland Campus 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 is evidenced by the presence of pre-contact archaeological sites, traditionally and culturally important places, and historic-era archaeological sites and structures. Throughout most of the region, hydroelectric development, agricultural activities, and construction have destroyed or covered most of these sites. However, because public access has been limited, archaeological sites present on the PNNL Richland Campus are largely intact and in good condition. This section describes the regional and historic context of the resources located there and briefly describes 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 Richland Campus are the historic contexts for three distinct cultural landscapes: 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 and the Cultural Present

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 ended, 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 Richland Campus.

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 portions of the PNNL Richland Campus for traditional cultural purposes and to access traditional resources and places located on the PNNL Richland Campus. These descendants include members of four federally recognized tribes (i.e., the Yakama Nation, Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation [CTUIR], and the Confederated Tribes of the Colville Reservation) and the Wanapum people (a non-federally recognized tribe that have strong ancestral, cultural, and historical ties to the PNNL Richland Campus). PNSO interacts and consults directly with the four federally recognized tribes and the Wanapum people who are also consulted on cultural resource issues in accordance with DOE Policy 144.1 and relevant legislation.

Three of the federally recognized tribes have treaties with the U.S. government. In June 1855, at Camp Stevens in the Walla Walla Valley, representatives of the United States negotiated treaties with leaders of the 14 tribes and bands of what would become the Yakama Nation, one with the three tribes that would become the CTUIR, and one with the Nez Perce Tribe. The U.S. Senate ratified the treaties in 1859. The negotiated treaties are as follows:

1. Treaty with the Walla Walla, Umatilla, Cayuse, etc. (June 9, 1855 12 Stats. 945)
2. Treaty with the Yakama (June 9, 1855; 12 Stats. 951)
3. Treaty with the Nez Perce (June 11, 1855; 12 Stats. 957)

The Yakama Nation, CTUIR, and the Nez Perce Tribe are federally recognized tribes that have the immunities and privileges available to other federally acknowledged Indian tribes by virtue of their government-to-government relationships with the United States as well as the responsibilities, powers, limitations, and obligations of such tribes (65 CFR 13298).

The terms of the three proceeding treaties are similar. Each of the three tribes agreed to cede large blocks of land to the United States. (The PNNL Richland Campus is located within the CTUIR's ceded

lands.) The tribes retained certain lands for their exclusive use (the three reservations) and also retained certain rights and privileges to continue traditional activities outside the reservations. These included 1) the right to fish (and erect temporary fish-curing facilities) at usual and accustomed places in common with citizens of the United States and 2) the privileges of hunting, gathering roots and berries, and pasturing horses and cattle on open and unclaimed lands.

The Confederated Tribes of the Colville Reservation was established by Presidential Executive Order in 1872. Today, over 8,700 descendants of 12 aboriginal tribes of Indians are enrolled in the Confederated Tribes of the Colville Reservation. Tribes with historical ties to the Hanford area are in the Palouse, the Moses Columbia, and the Nez Perce of Chief Joseph's Band. In recognition of these treaties, PNSO has a fiduciary responsibility and a federal trust relationship with treaty tribes. PNSO also facilitates access to usual and accustomed areas located on the PNNL Richland Campus.

Tribal members became actively involved with the protection of portions of the PNNL Richland Campus beginning in 1994, when it became clear to DOE the PNNL Richland Campus contained highly sensitive cultural and biological resources and were the impetus behind getting portions of the PNNL Richland Campus designated "preservation." Tribes have continued to play an active role in PNSO decision-making regarding the PNNL Richland Campus via various federal consultation efforts and in acknowledgement of tribal treaty rights as well as via face-to-face meetings with technical staff. See Section 4.1.4 for a detailed discussion on PNSO's outreach and consultation efforts with tribal consulting parties at the PNNL Richland Campus.

3.2.1.3 Euro-American Period

The Lewis and Clark expedition of 1805 began the Euro-American exploration and settlement of the general 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. Near the PNNL Richland Campus, historical activity began in the early 1900s in the region around Richland to the south and the community of Fruitvale to the north, when farming communities expanded with the construction of large-scale irrigation projects, including canals.

A review of historical maps (GLO 1865; USGS 1916; War Department 1943) and aerial photographs from 1943 provides evidence of historical land use on the PNNL Richland Campus and indicates that several land patents existed during the early 1900s, but no major Euro-American settlement occurred in this area. There were several primary and secondary roadways, a few standing structures that may have been early homesteads or farmsteads, and the Richland Irrigation Canal and its associated laterals. One of the laterals ran through the northern portion of the current PNNL Richland Campus, transporting water to the small community of Fruitvale. South of Horn Rapids Road the PNNL Richland Campus contained several privately owned land parcels used for agricultural as evidenced by the many cleared agricultural fields, farms, and scattered orchards depicted on the aerial imagery. Archaeological remains associated with this historical land use are present on the PNNL Richland Campus, including one lateral of the Richland Irrigation Canal, historical debris, and isolated concrete features.

Tribes used portions of the PNNL Richland Campus throughout the historical period up until 1943, when both Euro-American settlers and Native Americans were forced to relocate so that the federal

government could develop the land for the Manhattan Project. The tribes continue to have access to the PNNL Richland Campus for gathering, fishing, and ceremonial purposes.

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

Most of the PNNL Richland Campus was originally part of the DOE Hanford Site, which the federal government created as part of the Manhattan Project for the war effort in 1943. The Manhattan Project war effort rapidly transformed the Hanford Site from an isolated agricultural region to an industrial complex dedicated to producing 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. The 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 Richland Campus); 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 Richland Campus facilities are not part of this district.

In the late 1940s, portions of the present site of PNNL south of Horn Rapids Road and the surrounding area were used as a construction housing camp for postwar Hanford Site development. In 1951, the property was transitioned to the U.S. Army, which expanded the camp to house personnel and equipment for the support the air defense installations (anti-aircraft artillery sites) established on the Hanford Site. From 1951 to 1961 it was known as Camp Hanford (and/or the 3000 Area Camp) and consisted of a total of 3,700 ac (1500 ha). The anti-aircraft artillery sites were phased out during the late 1950s for the new NIKE missile installations. As such, Camp Hanford was no longer needed to support military defense of the site and was abandoned. 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 ac (12 ha) to DOE as a site for construction of the EMSL. By 2007, the PNNL Richland Campus consisted of approximately 350 ac (142 ha) of land that had been reassigned from EM to SC. Construction of the PSF on the land north of Horn Rapids Road started in 2007. Construction of additional facilities is planned to continue.

3.2.2 Historic Properties at the PNNL Richland Campus

Between 1968 and 2021, all of the PNNL Richland Campus has been surveyed for historic properties (Rice 1968a, b, 1968b; Cleveland et al. 1976; Galm and Benson 1980; Morgan 1981; Gard 1990; Gard and Chatters 1990; Minthorn and Chatters 1990; Chatters and Gard 1991; Harvey and Woody 1994; Nickens 1994; Wright and Cadoret 1994; Prendergast-Kennedy 2004; Hughes 2011; Hay et al. 2012, 2013a, b, c; Mendez et al. 2013; Sexton et al. 2013; McFarland et al. 2014; and Mendez et al. 2015). These inventories have identified and documented 49 places of historical and cultural interest on the PNNL Richland Campus. In addition, two National Register of Historic Places (NRHP)-eligible traditional cultural properties (TCP)are located within and extend beyond the boundary of the PNNL Richland Campus. The TCP, *Shu Wipa* has been and continues to be of cultural and historical importance to the Wanapum for traditional fishing, gathering, and ceremonial purposes. Although limited

information on the unnamed Yakama Nation TCP is available, the YN have indicated that the area and cultural material within it holds significance to them.

There are three additional culturally sensitive sites located near the Columbia River of historical and cultural significance to the Wanapum and other tribes that PNSO consults with (i.e., Yakama Nation, CTUIR, Colville, and Nez Perce Tribe). 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 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 46 documented sites, 34 are historic-era debris scatters and 12 date to the pre-contact period.

A lateral of the NRHP-eligible Richland Irrigation Canal falls within the PNNL Richland Campus. The southern portion of the canal was mitigated under a Memorandum of Agreement (MOA) with DAHP during the construction of the PSF complex in 2005.

In 2016, DOE-PNSO determined the original six buildings that made up the PNNL Richland Campus (Physical Sciences Laboratory, Engineering Development Laboratory, Auditorium, Mathematics Building, Research Operations Building, Life Sciences Laboratory II) historic under the NRHP. The buildings are individually eligible and collectively eligible as a historic district under Criterion A and C. Further management of these historic buildings will be addressed in a separate Historic Properties Management Plan.

3.3 PNNL Richland Campus Biological Resources

The PNNL Richland Campus 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 the Columbia River shoreline and native shrub-steppe uplands, which have been protected from most development since before 1943. Biological resources on the PNNL Richland Campus 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. Much of the northern portion of the PNNL Richland Campus 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 Richland Campus 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 the gopher (bull) snake (*Pituophis catenifer sayi*).

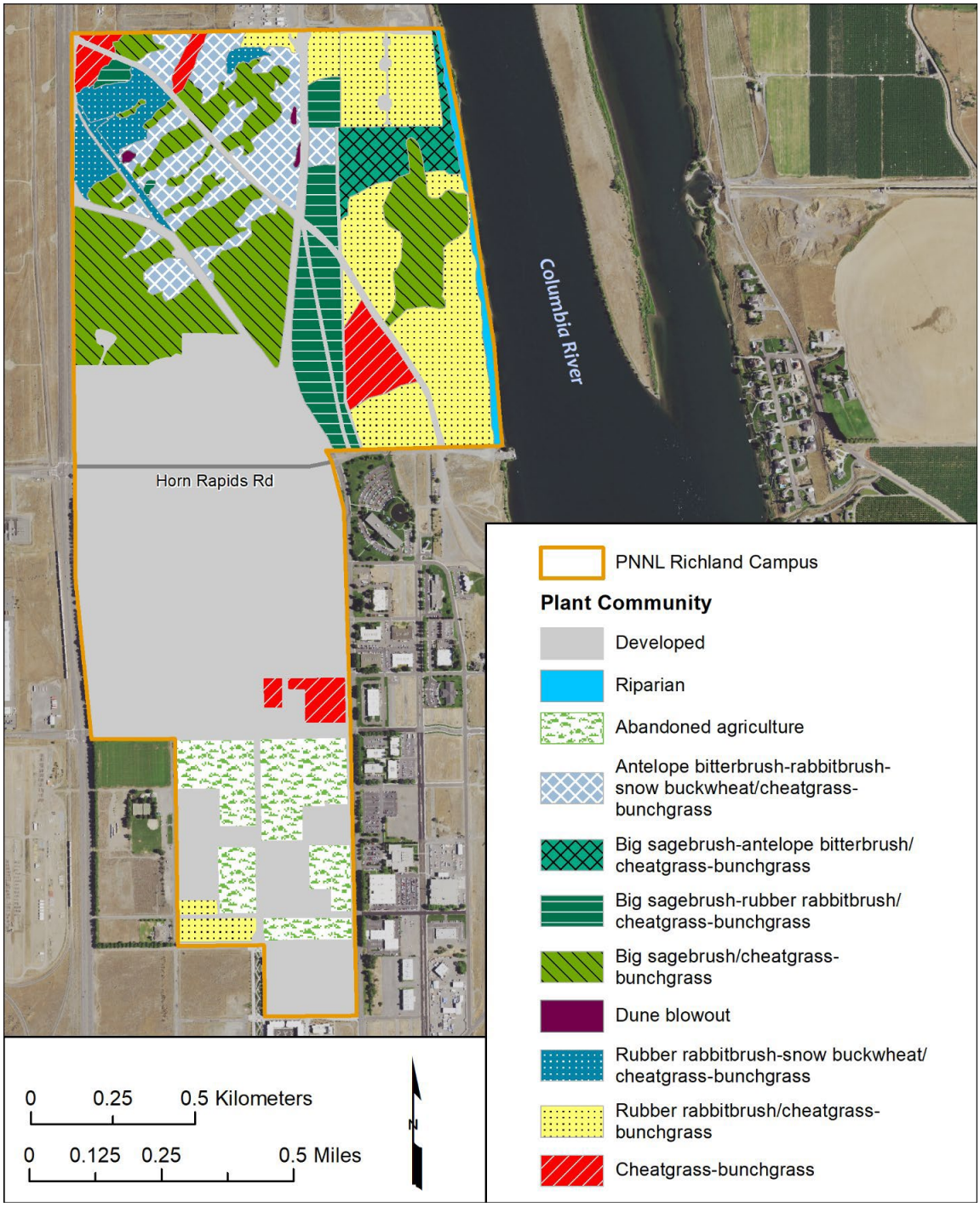

Figure 3.1. Habitats on the Federally Owned PNNL Richland Campus

3.3.2 Shrub-Steppe Uplands

The majority of the PNNL Richland Campus north of Horn Rapids Road consists of shrub-steppe habitats. The Columbia Basin (Plateau) Ecoregion historically included more than 14.8 million ac (6 million ha) 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 Richland Campus 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. In addition, Indian rice-grass (*Achnathrum hymenoides)* 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 spring parsley (*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 tribal consulting parties have identified food and medicinal plant species within the habitat.

Shrub-steppe uplands on the PNNL Richland Campus 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 Richland Campus (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 Richland Campus

Wildlife	**Genus and Species**	**Federal Status[(a)]**	**State Status[(b)]**
Black-tailed jackrabbit	*Lepus californicus*		Candidate
Burrowing owl	*Athene cunicularia*	Species of Concern	Candidate
Loggerhead shrike	*Lanius ludovicianus*	Species of Concern	Candidate
Northern sagebrush lizard	*Sceloporus graciosus*	Species of Concern	Candidate
Sage sparrow	*Amphispiza belli*		Candidate
Townsend ground squirrel	*Spermophilus townsendii*	Species of Concern	Candidate
Plants	***Genus and Species***	**Federal Status[(a)]**	**State Status[(b)]**
Grand redstem	*Ammania robusta*		Threatened
Persistent sepal yellowcress	*Rorippa columbiae*	Species of Concern	Endangered
Lowland toothcup	*Rotala ramosior*		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 Richland Campus, 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*). Many 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 Richland Campus 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 Richland Campus meets the requirements of federal regulations, addresses the concerns of consulting parties, such as tribes and SHPO, and other interested parties, avoids and/or 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/), 36 CFR Part 800, NHPA, *Native American Graves Protection and Repatriation Act* (NAGPRA), *American Indian Religious Freedom Act* (AIRFA), and *Archeological Resources Protection Act* (ARPA). This section describes the methods, actions, and strategies used to comply with these federal regulations and how cultural resources under PNSO oversight are managed and protected.

4.1 Cultural Resource Compliance

Section 106 of the NHPA requires federal agencies to account for the effect of their activities on properties listed in or determined eligible for listing in the NRHP and to consult with the consulting parties including, the SHPO, tribes, interested parties, and the Advisory Council on Historic Preservation (ACHP), if necessary, concerning those effects and determinations. Cultural resources reviews (CRRs) and consultations consistent with NHPA Section 106 are conducted for all actions with the potential to affect cultural or historic resources. The PNSO process for implementing NHPA Section 106 is similar for activities located on the PNNL Richland Campus as for activities located on other federal or non-federal properties. PNSO's process for implementing the NHPA also helps to assure that PNSO maintains compliance with other cultural resource-related laws such as ARPA and NAGPRA, or applicable state laws among others described in Appendix A.

4.1.1 PNNL Richland Campus Future Development MOA

In November 2018 a MOA was signed between PNSO, the WA SHPO, and Invited Signatories which covered:

1. the new construction, continued operation, and maintenance of new buildings, laboratories, support buildings, office buildings, and associated infrastructure located within the PNNL Richland Campus;
2. the continued operation and maintenance of existing PNNL buildings/structures located within the PNNL Richland Campus;

3. the modification and/or demolition of existing properties located on the PNNL Richland Campus which are not eligible for placement on the National Register of Historic Places (NRHP);
4. the lease of existing PNNL facilities/lands located on the PNNL Richland Campus;
5. the prohibition of public access to the Preservation Designated Area (PDA), with the exception of emergency services, as described in the PNNL RCFD EA and Navy haul road use.

Procedures have been developed to ensure that all activities that fall within the scope of the MOA are reviewed by PNSO and that the stipulations within the MOA are followed.

4.1.2 Programmatic Agreement for Operational and Maintenance activities on the PNNL Richland Campus

In September 2021 a Programmatic Agreement (PA) was signed between PNSO, the WA SHPO, and Invited Signatories which covered operational and/or maintenance activities conducted on the PNNL Richland Campus. The purpose of the PA is to ensure that consulting parties are provided information on operational and maintenance activities being conducted on the PNNL Richland campus that have the potential to affect historic properties. While simultaneously ensuring that consulting parties are not inundated by the myriad of maintenance and operational activities conducted on the PNNL campus that do not have the potential to affect historic properties. The PA provides an agreed upon alternative communication protocol between PNSO, WA SHPO, and Consulting Parties. Procedures have been developed to ensure that all activities that fall within the scope of the MOA are reviewed by PNSO and that the stipulations within the MOA are followed.

4.1.3 Section 106 Compliance Process for activities that fall outside of the PNNL RCFD MOA and M&O PA

To comply with NHPA Section 106 and Executive Order 11593, PNSO reviews all actions that have the potential to affect cultural resources following the protocol described at 36 CFR Part 800; Figure 4.1 provides an outline of the Section 106 process.

Actions that require a CRR are normally identified as part of the project planning review process. This includes research proposal 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.

In general, CRRs for NHPA Section 106 compliance 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 modifications of abandoned buildings that are conducted using federal funding (e.g., 300 Area)
- deactivation or decommissioning of buildings
- siting decisions for buildings and facilities
- activities that significantly change the visual landscape and/or soundscape

PNSO is the lead federal agency for any projects on the PNNL Richland Campus, or when DOE funding is used for PNNL activities, 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 qualified cultural resource staff at PNNL but can be conducted by qualified subcontractors or by other federal agencies if they are the property owner or project-funding entity, depending on the specific contract or project arrangements.

CRR requests are reviewed by the Secretary of Interior-qualified PNNL cultural program manager and PNSO cultural resource representative.

The preparation of a CRR involves four steps and entails consultation and interaction with tribal consulting parties and SHPO, and other potential consulting parties throughout these steps pursuant to 36 CFR 800:

1. Notify the SHPO, tribal consulting parties, and other potential consulting parties (i.e., interested parties) of undertaking and area of potential effect (APE).
2. Review existing information and records including consultation with tribal consulting parties and interested parties to gather input on cultural resources that may be within the APE.
3. Develop and consult on a research design to complete the cultural resources fieldwork and identify and evaluate cultural resources that may be NRHP-eligible (as per 36 CFR 63, *Determination of Eligibility for Inclusion in the National Register of Historic Places)*.
4. Write a CRR report that documents fieldwork methodology and results including NRHP status of identified cultural resources and a finding of effect.

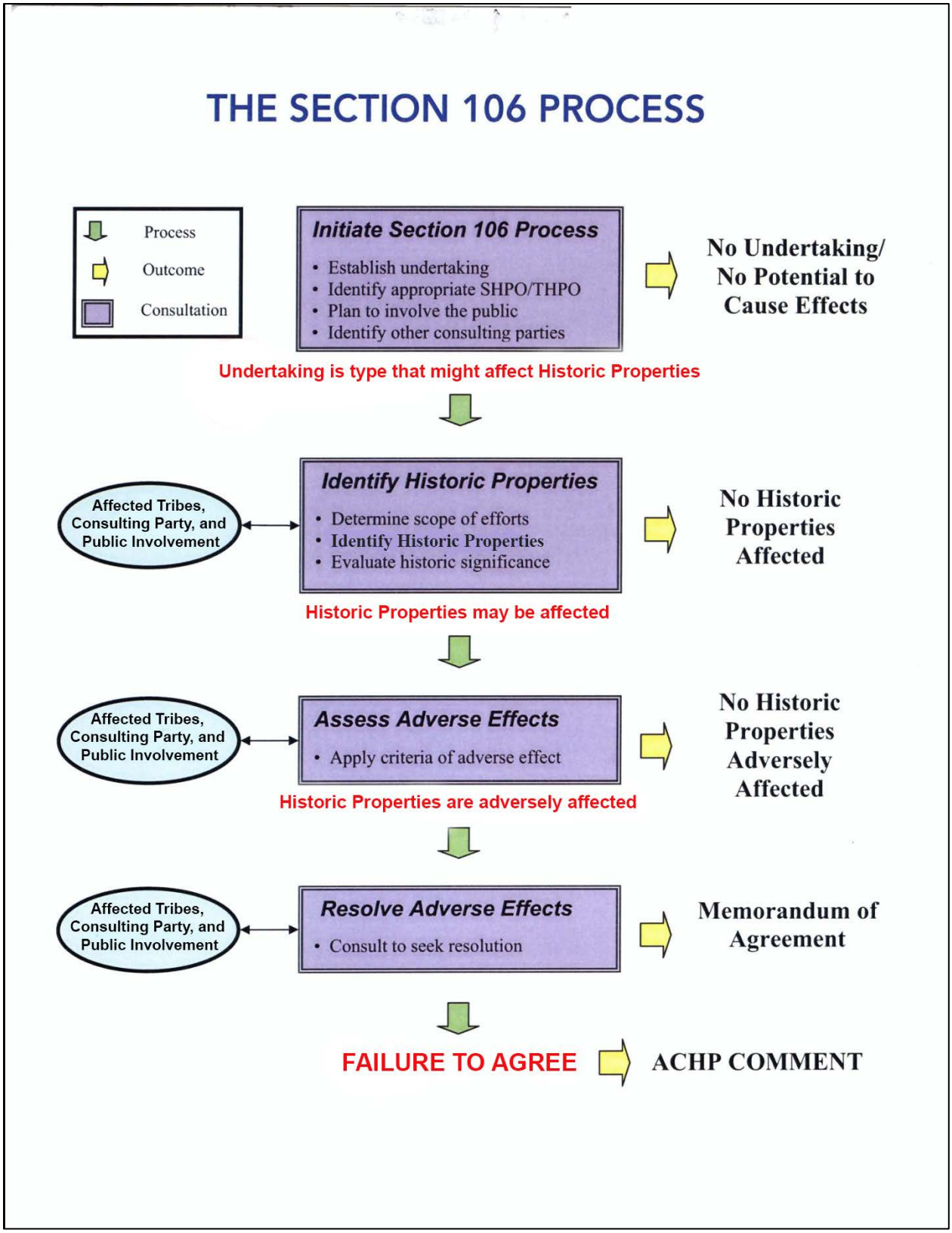

Figure 4.1. Diagram of the Section 106 Process

PNSO maintains a tribal consultation contact list for the Wanapum, Yakama Nation, CTUIR, Nez Perce Tribe, and Confederated Tribes of the Colville Reservation for all undertakings that occur on the PNNL Richland Campus. Through longstanding relationships with these tribes, PNSO and tribal consulting parties have agreed on specific timelines when conducting CRRs that take place on the PNNL Richland Campus similar to those used on the Hanford Site. Specifically, PNSO affords tribal consulting parties a 10-day review of the APE notification and provides 7-day notice and invitation to tribal consulting parties when performing cultural resource-related fieldwork. When conducting activities off of the PNNL Richland Campus, PNSO works with the relevant SHPO to identify tribal consulting parties that may have historical ties to a project APE. PNSO follows applicable state laws regarding archaeological excavations and any permitting requirements or state-specific cultural resource review requirements in addition to requirements set forth in 36 CFR 800. In the state of Washington, these include RCW 27.53, *Archaeological Sites and Resources*, and WAC 25-48, *Archaeological Excavation and Removal Permit.*

Once the draft CRR is complete, it is provided to the SHPO, the tribal consulting parties, and other consulting parties such as interested 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 the consulting parties disagree.

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

4.1.4 Emergency Review Process for activities that fall outside of the PNNL RCFD MOA and M&O PA

Consistent with 36 CFR 800.12, emergency situations in which there is an immediate risk to employee or environmental safety do not require a CRR until the emergency is over. In emergency situations, the responsible parties shall call the single Point of Contact (POC) (509-375-2400), who will then notify the PNNL cultural resources program manager. The PNNL cultural resources program manager will work with cultural resources staff and the responsible parties to determine if sensitive resources are located in the affected area and explore options that could avoid or 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 e-mail approval to proceed with actions to rectify the emergency and request that a CRR form be submitted as soon as possible. PNSO is required to notify the SHPO and tribal consulting parties that attach historical and cultural significance to historic properties located near the emergency response of the activity. Tribal consulting parties have 7 days to reply to the notification. For emergencies occurring on the PNNL Richland Campus, PNSO will notify the tribal consulting parties identified on the PNNL Richland Campus consultation list. A retroactive review will then be done, which will be completed and follow the regular 36 CFR 800 steps and time frame. Project personnel will be instructed to leave excavations open to allow inspection by an archaeologist. These emergency situations are the only instance in which a verbal approval to proceed may be granted. When possible, emergency projects will follow the full review procedure.

4.1.5 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 the discovery of human remains, is always possible. The following sections provide PNSO’s contingency plan in the event of an unexpected discovery.

4.1.5.1 Inadvertent Discovery of Archaeological Resources

While field surveys should locate most eligible properties within a project area, it is possible that unrecorded cultural materials may be discovered during project activities, particularly if the activities involve digging or excavating. If an Inadvertent Discovery of Archaeological Resources is made on the PNNL Richland Campus, then the Inadvertent Discovery Procedure (PNSO-PCDR-039) for the campus shall be followed. This procedure was developed in consultation with the WA SHPO and Invited Signatories to the PNNL RCFD MOA.

4.1.5.2 Inadvertent Discovery of Human Remains

If there is an inadvertent discovery of potential human remains on the PNNL Richland Campus, then the Inadvertent Discovery of Human Remains Procedure (PNSO-PCDR-040) shall be followed. This procedure was developed in consultation with the WA SHPO and Invited Signatories to the PNNL RCFD MOA.

4.1.6 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 SHPO and the federal ACHP. PNSO staff maintains contact with SHPO staff to assure that SHPO is notified of PNSO undertakings and that all projects are reviewed in a timely manner.

As required by NHPA, consultation is initiated with federal, state, and local agencies, as well as tribal consulting parties 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.

As a federal land managing agency, PNSO has multiple requirements to consult with tribal consulting parties that have historical and legal ties to the PNNL Richland Campus regarding the protection of cultural and biological resources located on the PNNL Richland Campus. These include a responsibility to recognize tribal treaty rights and to meet consultation requirements set forth in NHPA, NAGPRA, AIRFA, ARPA, Executive Order 13007, “Indian Sacred Sites,” Executive Order 13175, “Consultation and Coordination with Indian Tribal Governments,” DOE Policy 141.1, “Department of Energy Management of Cultural Resources,” and DOE Order 144.1, “Department of Energy American Indian Tribal Government Interactions and Policy.” Cooperation and consultation may include technical-level interactions and government-to-government interactions. Government-to-government interactions occur through a formal, documented process as required by DOE Policy 141.1. These interactions consist of letters and meetings between PNSO management and tribal leaders and other federal and state agencies. Technical interactions occur between PNSO, PNNL, and tribal cultural resource staff. These interactions occur via regular face-to-face working group meetings. They also occur informally when cultural contractor staff and tribal technical staff are in the field discussing cultural resource issues. For the PNNL Richland Campus, PNSO maintains a consultation list that identifies appropriate tribal government- and technical-level contacts for all consultation activities. Off of the PNNL Richland Campus, cultural resource consultation occurs via specific NHPA Section 106 compliance correspondence and meetings. Outreach and interactions are intended to promote a spirit of cooperative management and focus on PNSO 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 Resources Management and Protective Measures on the PNNL Richland Campus

In addition to PNSO's requirements to comply with NHPA Section 106 and its implementing regulations 36 CFR 800 and NAGPRA, PNSO must also proactively protect and manage cultural resources located on the PNNL Richland Campus in accordance with NHPA Section 110, ARPA, the AIRFA, Executive Order 11593, Executive Order 13287, and Executive Order 13007. These laws include requirements for archaeological site monitoring, awareness of the potential for archaeological site looting, and a variety of protection and preservation actions for cultural resources located on the land that PNSO 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 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. PNSO has completed cultural resource inventories of all of the federally owned or controlled portions of the PNNL Richland Campus. PNNL staff performs annual monitoring of the PNNL Richland Campus in coordination with tribal consulting parties. This monitoring involves on-the-ground inspection of important areas, documentation of changes since the previous site visit, and an e-mail report to the PNSO cultural resource representative for transmittal to DAHP and tribal consulting parties. Two of the monitored sites, while primarily on the PNNL Richland Campus, 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 Richland Campus 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 Richland Campus.

4.2.2 Archeological Resources Protection Act Compliance

In accordance with Section 9 of Archaeological Resources and Protection Act (ARPA), PNSO has responsibility to protect and keep confidential specific archaeological site location information (particularly for archaeological resources over 100 years old) from the general public. PNSO also has the responsibility to provide secure protection of associated archaeological site records and artifacts on the federally managed PNNL Richland Campus. Accordingly, PNSO and PNNL have taken steps to assure all archaeological resource records and electronic information are stored in a secure location and server Dissemination of archaeological information contained in NHPA Section 106 documents is limited and are marked and treated as Official Use Only.

Section 10 of ARPA also requires each federal land manager to establish a program to increase public awareness of the significance of the archaeological resources located on public lands in a manner that

does not reveal archaeological site location information. PNSO's outreach efforts are described in Section 4.1.4 "Cultural Resources Outreach and Consultation". Additionally, PNSO has implemented protective measures as outlined in Section 4.2 "Cultural Resources Management and Protective Measures".

Section 4 of ARPA directs federal land managers to issue an ARPA permit prior to the controlled archaeological excavation or removal of archaeological resources from public land if the request is from a qualified archaeologist "for the purpose of furthering archaeological knowledge in the public interest." (ARPA 1979). ARPA permits are required when such a request is made by an outside party. PNSO does not anticipate the need to issue such permits for the PNNL Richland Campus.

Section 6 of ARPA prohibits excavation, removal, damage, alteration, or defacement of archaeological sites, although there is a permitting process available for controlled archaeological excavation and removal. Section 6 also prohibits the sale or exchange of any archaeological resource located on federally managed lands. There are criminal and civil penalties for intentional damage and inadvertent damage. In the event evidence of looting or inadvertent damage to archaeological sites is encountered on the PNNL Richland Campus, PNSO would follow penalty guidance outlined in Section 6 (d) for criminal penalties and Section 7 for civil penalties, including consideration of the archaeological or commercial value and the cost of the restoration and repair of the archaeological site damaged.

Section 14 of ARPA directs federal land managing agencies to implement reporting requirements for ARPA violations. PNSO and PNNL have notification and consultation procedures in the event site looting was to occur on the PNNL Richland Campus. This includes immediately calling 509-375-2400, avoid interacting with individuals looting the site, treatment of the scene as a crime scene, mapping, recording, and photographing evidence of looting, and a process for reporting violations to the Benton County Sheriff and notifying the tribal consulting parties. In addition, PNSO's annual archaeological site condition monitoring on the PNNL Richland Campus as described in Section 4.2.1 "NHPA Section 110 Compliance" and PNSO's site security measures described in Section 4.2.2. "Protective Measures for Culturally Sensitive Area" provide opportunities to prevent and/or document site looting. ARPA also requires annual reporting to the Secretary of Interior on the number of archaeological sites recorded, evaluated and/or damaged, the number of acres surveyed, the number of archaeological permits issued, and the number archaeological artifacts managed by a federal land managing agency. PNNL completes this report on an annual basis for PNSO. PNSO submits this documentation to DOE-Headquarters for final submission to the Secretary of the Interior.

4.2.3 Protective Measures for the Preservation Designated Area (PDA)

The PNNL Richland Campus contain the PDA, an area that has been set aside for cultural and biological mitigation activities. Due to ongoing mitigation activities access to the PDA is currently being managed by the DOE Richland Office (RL). However, PNSO is still the landowner.

The PDA is protected by regular monitoring of specific projects, annual archaeological monitoring, Hanford security staff, a fence which surrounds the PDA on the North/West/South sides, and through limiting access. Sensitive resources are monitored annually as part of the NHPA Section 110 compliance process described above.

Access to the PDA 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
- .

RL facilitates access to members of the Wanapum, Yakama Nation, CTUIR, Colville, and the Nez Perce tribes to gather traditional resources and for practicing traditional cultural and religious ceremonies in accordance with AIRFA; tribal treaty rights; DOE Policy 141.1; and Executive Orders 11593, 13175, and 13007. The PNSO cultural resources representative can provide the contact information for the RL personnel who can grant access to the PDA if needed.

4.3 Cultural Resource Records, and Documentation Storage

PNNL facilities where cultural resource information is stored include a secure records-holding area, computerized databases, and a geographic information system (GIS). 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 Richland Campus is archived electronically. Records and data are stored in accordance with 36 CFR 79. Tribal access to the records/data can be provided and shared upon request.

In Washington, PNSO follows DAHP guidance on cultural resources report and documentation standards. 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*. Outside of Washington State, PNSO will follow relevant state cultural resources reporting and documentation guidance.

Approximately 80 artifacts were collected from the PNNL Richland Campus before the site was reassigned to DOE-SC. These artifacts are curated as part of DOE-RL's Hanford cultural resources collection. At this time RL is responsible for curating the small number of artifacts from the PNNL Richland Campus at the Wanapum Heritage Center curation room. These items (along with the rest of the Hanford Collection) are stored and managed in accordance with the *Curation Plan for Hanford's Archaeological Collection.* Should DOE-RL move the items in the collection to a different facility in the future, the artifacts collected on the PNNL Richland Campus will be moved along with the rest of the Hanford collection.

If historic artifacts are collected on the PNNL Richland Campus PNSO will work with DOE-RL Hanford to curate these items. If precontact artifacts are inadvertently discovered on the PNNL Richland Campus the Inadvertent Discovery Procedure shall be followed. For activities on non-federally owned lands, PNSO will follow relevant state requirements on artifact curation.

5.0 Biological Resource Compliance and Management

PNNL research projects are conducted both on the PNNL Richland Campus 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 Section 7 of the *Endangered Species Act* (ESA), 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 Richland Campus 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 the *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 BRR are normally identified as part of the project planning review process. This includes research proposal evaluations, 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, 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 subject matter experts (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:

- implementing alternatives that would result in fewer adverse impacts
- locating projects at a less ecologically sensitive site
- reducing or moving the project footprint or reducing land-use requirements
- scheduling 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 the 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 (e.g., installation of nest-exclusion devices).

PNNL has developed a communications program to educate staff about the need for, and importance of, migratory bird protection. This program has notably increased staff awareness, demonstrated by numerous reports of bird nests independent of the normal BRR process. When nests are identified in areas where disturbance is likely, signage is provided to keep staff away from the site and the nest is monitored to determine when normal activities can resume.

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 Richland Campus

Natural resource management on the PNNL Richland Campus 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 Richland Campus 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 within the management areas. Protection and conservation of species of

concern and their habitats on the PNNL Richland Campus 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 (e.g., 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 determine whether any resource degradation is occurring. Initial inventories of biological resources have been conducted at the PNNL Richland Campus. 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 Richland Campus 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 Richland Campus, 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 database, including a GIS and database files, for retrieval, review, and reporting.

Species protected by federal regulations are identified and updated regularly in the *Federal Register* and other agency publications. 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 websites with up-to-date information about species and habitats of concern, including wetlands, which 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. 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

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."

The requirements also include the following U.S. Department of Energy (DOE) Orders and Policies:

- DOE Policy 141.1, "Department of Energy Management of Cultural Resources"
- DOE Order 144.1, "Department of Energy American Indian Tribal Government Interactions Policy"

On the PNNL Richland Campus, as on other federal properties, federal statues supersede existing state legislation pertaining to cultural resources. However, for work occurring off the PNNL Richland Campus, where applicable, PNSO will follow appropriate state laws regarding cultural resources. In Washington State, these include the following:

- Revised Code of Washington 27.44, *Indian Graves and Records*
- Revised Code of Washington 27.53, *Archaeological Sites and Resources*
- Revised Code of Washington 68.60, *Abandoned and Historic Cemeteries and Historic Graves*
- Washington Administrative Code 25-48, *Archaeological Excavation and Removal Permit*

***National Historic Preservation Act of 1966* (16 U.S.C. 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 define 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 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 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, Native American tribes, and other "private individuals" regarding these activities is also required when appropriate.

Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on historic properties and gives the ACHP 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 U.S.C. 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 U.S.C. 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, ACHP, and appropriate federal, state, and local agencies may be consulted during the process.

Archaeological and Historic Preservation Act of 1974 **(16 U.S.C. 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 U.S.C. 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 ARPA. 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 ARPA by lowering the limit of the felony violation of the ARPA 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 U.S.C. 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 sure 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)**

Executive Order 13007 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*)

Executive Order 13175 directs federal agencies to develop a process to meaningful tribal input when developing regulatory policies that have tribal implications and to consult with tribal authorities.

Preserve America* (Executive Order 13287*)

Executive Order 13287 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.

DOE Policy 141.1, *Department of Energy Management of Cultural Resources*

The purpose of DOE Policy 141.1 is to ensure that DOE maintains a program that reflects the spirit and intent of cultural resource legal mandates. Two specific goals are as follows:

1. Ensure that DOE programs and field elements integrate cultural resources management into their missions and activities.
2. Raise the level of awareness within DOE concerning the importance of DOE's cultural resource-related legal and trust responsibilities.

DOE Order 144.1, *Department of Energy American Indian Tribal Government Interactions and Policy*

The purposes of DOE Order 144.1 are to communicate the departmental, programmatic, and field responsibilities for interacting with American Indian Governments; transmit the DOE American Indian Alaska Native Tribal Government Policy including its guiding principles; and transmit the Framework for Implementation of the Policy.

Revised Code of Washington 27.44, *Indian Graves and Records*

This law establishes protection measures for Native Indian burial grounds and historic graves located on public and private lands. The law outlines penalties for the mutilation, defacement, and/or desecration of these resources while also outlining the "duty to notify" requirements for any person who discovers skeletal human remains.

Revised Code of Washington 27.53, *Archaeological Sites and Resources*

This chapter declares that the public has an interest in the conservation, preservation, and protection of the state's archaeological resources and the knowledge to be derived and gained from scientific study of these resources. This legislation also details permit requirements, for both public and private lands, for the disturbance (i.e., removal, alteration, penetration, or excavation) of historic and/or archaeological resources.

Revised Code of Washington 68.60, *Abandoned and Historic Cemeteries and Historic Graves*

This law establishes protection measures for cemeteries and historic graves. The law outlines penalties for the defacement of such properties while also outlining the "duty to notify" requirements for any person who discovers skeletal human remains.

Washington Administrative Code 25-48, *Archaeological Excavation and Removal Permit*

This chapter establishes application and review procedures for the issuance of archaeological excavation and removal permits and for the issuance of civil penalties as provided for in Chapter 27.53 of the Revised Code of Washington (RCW).

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 responsible for their enforcement, as well as guidelines promulgated by 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 resources review (BRR) process are described briefly here.

***Endangered Species Act* (16 U.S.C. 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 BRR 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 U.S.C. 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 BRR 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 U.S.C. 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 BRR 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 U.S.C. 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 BRR process provides assurance that a proposed action will not adversely affect bald or golden eagles.

***Marine Mammal Protection Act* (16 U.S.C. 1361 et seq.)**

The *Marine Mammal Protection Act of 1972*, as amended, prohibits, with certain exceptions, the taking (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 U.S.C. 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 BRR 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 BRR supports the CERCLA process in the same way that it would support a NEPA review.

***Resource Conservation and Recovery Act* (42 U.S.C. 6901 et seq. and 42 U.S.C. 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. The 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 comply with other applicable laws.

***Clean Water Act* (33 U.S.C. 1251-1387)**

Section 404(b)(1) of the *Clean Water Act* (CWA) authorizes the 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 U.S.C. 670a-670o)**

The *Sikes Act* (Public Law 86-797) originally provided for cooperation by the Department of the Interior and the 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, the National Aeronautics and Space Administration, the U.S. Forest Service, and the 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 U.S.C. 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 U.S.C. 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 U.S.C. 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 BRR process is the primary means by which DOE is able to determine whether unintentional take is likely and the potential effects of such take. The Executive Order 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. 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 BRR 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.

A.3 Other Requirements

DOE Order 430.1B *Real Property and Assets Management*

The objective of this DOE Order is to establish a corporate, holistic, and performance-based approach to real property life-cycle asset management that links real property asset planning, programming, budgeting, and evaluation to program mission projections and performance outcomes. To accomplish the objective, this DOE Order identifies requirements and establishes reporting mechanisms and responsibilities for real property asset management. This includes provisions for site-wide planning recognizing that departmental land and facilities are valuable national resources and directs that land-use planning and stewardship responsibilities will be implemented consistent with the principles of ecosystem management and sustainable development. Land-use plans must consider cultural and natural resource management.

DOE Order 436.1 *Departmental Sustainability*

The purpose of this DOE Order is to provide requirements and responsibilities for managing sustainability within the DOE to ensure the DOE carries out its missions in a sustainable manner that addresses national energy security and global environmental challenges, and advances sustainable, efficient, and reliable energy for the future. Sustainability is defined to include the conservation of natural resources while sustaining assigned mission activities, and the DOE Order includes responsibilities for the preservation of cultural and natural resources.

A.4 References

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33 CFR Parts 320-330. "U.S. Army Corps of Engineers Permit Program Regulations, Navigation and Navigable Waters." *Code of Federal Regulations*. U.S. Department of Defense.

36 CFR Part 60. "National Register of Historic Places." *Code of Federal Regulations*. National Park Service, U.S. Department of the Interior.

40 CFR Part 230 Section 404(b)(1). "Guidelines for Specification of Disposal Sites for Dredged or Fill Material." *Code of Federal Regulations*. U.S. Environmental Protection Agency.

40 CFR Part 1500. "Purpose, Policy, and Mandate." *Code of Federal Regulations*. Council on Environmental Quality.

50 CFR Part 10.13. "List of Migratory Birds." *Code of Federal Regulations.* U.S. Fish and Wildlife Service.

50 CFR Part 17. "Endangered and Threatened Wildlife and Plants." *Code of Federal Regulations*. U.S. Fish and Wildlife Service.

50 CFR Part 600. "Magnuson-Stevens Act Provisions." *Code of Federal Regulations*. U.S. Department of Commerce.

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