LOWER MONUMENTAL MASTER PLAN

US Army Corps
of Engineers ®
Walla Walla District

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BPA	Bonneville Power Administration
BRZ	boat restricted zone
CFR	Code of Federal Regulation
cfs	cubic feet per second
Colville	Confederated Tribes of the Colville Reservation
Corps	U.S. Army Corps of Engineers
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
District	Walla Walla District
DM	Design Memorandum
EA	Environmental Assessment
EM	Engineer Manual
ENS	Environmental Stewardship
EO	Executive Order
EP	Engineer Pamphlet
EPA	Environmental Protection Agency
ER	Engineer Regulation
ERDC	Engineer Research and Development Center
ESA	Environmentally Sensitive Area
FCRPS	Federal Columbia River Power System
FONSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Conservation Act
GIS	geographic information system
HEP	Habitat Evaluation Procedure
HMU	Habitat Management Unit
IPMP	Integrated Pest Management Plan
LSRFWCP	Lower Snake River Fish and Wildlife Compensation Plan
MRM	Multiple Resource Management
MRM-FIRA	Multiple Resource Management-Future and Inactive Recreation Areas
MRM-LDR	Multiple Resource Management-Low Density Recreation

MRM-WM	Multiple Resource Management-Wildlife Management
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
O&M	Operation and Maintenance
OMP	Operational Management Plan
PL	Public Law
Project	Little Goose Lock and Dam Operating Project
PSMP	Programmatic Sediment Management Plan
RM	river mile
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Officer
TCP	Traditional Cultural Property
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WRDA	Water Resources Development Act
WSDOT	Washington State Department of Transportation
WSU	Washington State University
Yakama	The Confederated Tribes and Bands of the Yakama Nation

PREFACE

The Lower Monumental Master Plan was first approved in 1966. There has been one supplemental change, signed in 1969, but no full revisions since the original Master Plan was approved. Most of the changes in the current plan reflect new resource objectives, a new land classification system that updates 1966 classifications to existing conditions, and documentation of land and land classification changes between 1966 and present day. This plan also includes changes in land classification that were made in conjunction with a multidisciplinary team and input from the public.

The format for this plan is outlined in Engineer Pamphlet 1130-2-550 (Corps 1996), revised January 2013, which sets forth policy and procedure to be followed in preparation and revision of project master plans.

The Master Plan is intended to serve as a guide for the orderly and coordinated development, management, and stewardship of all lands, facilities, and water resources of Lower Monumental Lock and Dam. This plan is an overarching framework for the more detailed Operational Management Plan, which is developed after the Master Plan is completed and updated annually.

The 2020 Master Plan presents an inventory of land resources and how they are classified, existing park facilities, an analysis of resource use, anticipated influences on Project operation and management, and an evaluation of future needs. It presents data on changes from 1966 to present conditions, anticipated recreational use, sensitive resources requiring protection, and mitigation requirements under the Lower Snake River Fish and Wildlife Compensation Plan (Corps 1975).

1. Introduction

This document is the Lower Monumental Lock and Dam Master Plan (Master Plan) for management of the lands and associated recreational, natural, and cultural resources of Lower Monumental Lock and Dam (also referred to as the Project throughout the rest of the document). Master Plans are required for civil works projects and other fee-owned lands for which the U.S. Army Corps of Engineers (Corps) Walla Walla District (District) has administrative responsibility for management. Chapter 1 identifies the authorized purposes and provides a description of the Project, and provides information about the scope, goals, and planning processes of this Master Plan.

1.1. PROJECT AUTHORIZATION

The first formal proposal by Congress for the improvement of the Snake River for navigation and other purposes was made in 1902. This was followed by other actions, notably in 1910 and 1935, eventually leading to the River and Harbor Act of 1945 (Public Law [PL] 79-14), which authorized construction of a series of dams on the reach of Snake River downstream from Lewiston, Idaho, substantially in accordance with the plan submitted in House Document Numbered 704, Seventy-fifth Congress. House Document 531, Eighty-First Congress, Second Session, dated March 20, 1950, proposed a four-dam plan with Lower Monumental as the second unit of the four dams. Construction funds for Lower Monumental Lock and Dam were first appropriated under PL 89-16, dated April 30, 1965. The main dam structure and installation of the first three power-generating units was completed in 1969; the remaining three units were operational in 1981. A legislative history for the Project is provided in Appendix A, Legislative History of Lower Monumental Lock and Dam.

1.2. AUTHORIZED PURPOSES

The purposes of Lower Monumental Lock and Dam, as originally authorized by Congress (River and Harbor Act of 1945 [P.L. 79-14]), include navigation, irrigation and hydroelectric power (if warranted), with fish and wildlife conservation, and recreation added later as additional purposes. The Master Plan does not address the authorized purposes of navigation, hydroelectric power, or incidental irrigation.

1.2.1. Recreation

Section 4 of the Flood Control Act of 1944, as amended in 1946 and 1954 and by Section 207 of the 1962 Flood Control Act (PL 87-874), is the basic authority for the initial recreation development on Lake Bryan.

The Corps is the largest provider of water-based outdoor recreation in the nation. With more than 400 lakes and river projects in 43 states, the Corps plays a major role in meeting the nation's outdoor recreation needs. Popular recreation activities around Lake West include fishing, swimming, picnicking, boating, hunting, and camping. There are several day-use areas, campsites, parks, habitat management units (HMUs), boat ramps, and a marina.

1.2.2. Fish and Wildlife

The Fish and Wildlife Coordination Act (FWCA) of 1958 (PL 85-624) provides authority to incorporate project features or structures for conservation of fish and wildlife. Under the guidance of this law, the various proposals and concepts set forth in this Master Plan have been, and will continue to be, coordinated with the fish and wildlife agencies.

The Lower Snake River Fish and Wildlife Compensation Plan (LSRFWCP) was authorized by the Water Resources Development Act (WRDA) of 1976, Section 102, PL 94-587 (October 1976). It was amended by WRDA 1986, Section 856, PL 99-662 (November 1986), to increase project cost. It was also amended by WRDA 2007, Section 3165, PL 110-114, to add woody riparian vegetation restoration to the plan.

The Corps developed the LSRFWCP to comply with the FWCA and to provide mitigation for fish and wildlife losses caused by the construction of Ice Harbor, Lower Monumental, Little Goose, and Lower Granite Locks and Dams on the Snake River in Washington and Idaho.

As originally authorized, the plan was divided into two parts: fisheries compensation and wildlife compensation. Fisheries compensation centered on fish propagation facilities and providing anglers access along tributary streams. The wildlife compensation involved on-project lands habitat development, off-project habitat acquisition, and the purchase and release of game farm birds (pheasants). More detailed information relating to Project lands associated with the LSRFWCP can be found in Chapter 4, Land Classification; Chapter 5, Resource Plan; and Chapter 6, Special Topics.

The fish and wildlife mission is therefore managed under two different authorities – environmental stewardship (ENS) as authorized under the Projects general operation and management (O&M) budget, and mitigation as authorized under the FWCA and associated

LSRFWCP. This presents unique opportunities, like the ability to manage fish and wildlife habitat on lands classified under a few different land classifications. It also presents unique challenges, especially funding challenges, due to the funding structure of ENS in the District.

Yearly funding of the ENS mission is a combination of appropriated funding by Congress plus matching funds from Bonneville Power Association (BPA) based on a pre-determined calculation; the District must receive both funding sources to execute the funds. In budgeting outyears, sometimes the District only receives the appropriated portion of the funding (without the BPA matching funds), which affects how much work can be done (e.g., habitat planting, invasive control measures, boundary surveys).

Mitigation development under the LSRFWCP has been funded by construction general funds, appropriated by Congress (WRDAs 1976, 1986, 2007). Those funds were scheduled to end in 2019, after which the District is responsible to continue O&M of these mitigation lands into the future.

1.3. PURPOSE AND SCOPE OF THE MASTER PLAN

The Lower Monumental Master Plan is a strategic land use document that guides the comprehensive management and development of all Project recreational, natural, and cultural resources throughout the life of the Project. This Master Plan guides and articulates Corps responsibilities pursuant to Federal laws to preserve, conserve, restore, maintain, manage, and develop the land, water, and associated resources at the Project. It is dynamic and flexible, based on changing conditions, and intended to be effective for about 20 years. The Master Plan focuses on overarching management goals and objectives.

Details of design, management, administration, and implementation are addressed in another document, the Lower Monumental Operational Management Plan (OMP). The OMP is a 5-year management plan that details information required to implement the concepts described in the Master Plan. Neither the OMP nor the Master Plan addresses regional water quality, water management, or the operation and maintenance of Project operations facilities such as Lower Monumental Lock and Dam or hydropower production at the dam. Actions identified in the OMP should be reviewed annually to identify upcoming actions needing review under the National Environmental Policy Act (NEPA) and other applicable environmental laws and regulations.

The Master Plan was developed with consideration of regional and local needs, resource capabilities and suitability, and expressed public interests consistent with authorized Project purposes and regulations. The Lower Monumental Master Plan was written in 1966

(Corps 1966). A revision is warranted due to the age of the 1966 Master Plan, changes in Corps policy and guidance regarding master plans, land purchases, management changes, and changes in visitor use.

Because it has been more than 50 years since the last Master Plan for the Lower Monumental Project, it would be very difficult to document all the changes that have occurred over the years. We have attempted to capture some of the most important and impactful changes, such as the addition of mitigation lands and the increasing challenges of invasive species. The Master Plan is a future-facing document, so it is important to capture the history of the Project while anticipating what will continue to impact the Project in coming years.

An Environmental Assessment (EA) was conducted as an integral part of developing the 2020 Master Plan and can be found in Appendix B.

1.4. PROJECT DESCRIPTION

Lower Monumental Lock and Dam is located on the Snake River, at river mile (RM) 41.6, 31.9 miles upstream from Ice Harbor Lock and Dam, in the southeastern corner of Washington State (Figure 1-1). The dam and the reservoir lie in southeast Washington, in Franklin, Walla Walla, Whitman, and Columbia Counties. The reservoir or lake created by the dam extends upstream on the Snake River almost 29 miles to Little Goose Lock and Dam, more than 366 RMs from the Pacific Ocean. It is named Lake Herbert G. West (Lake West).

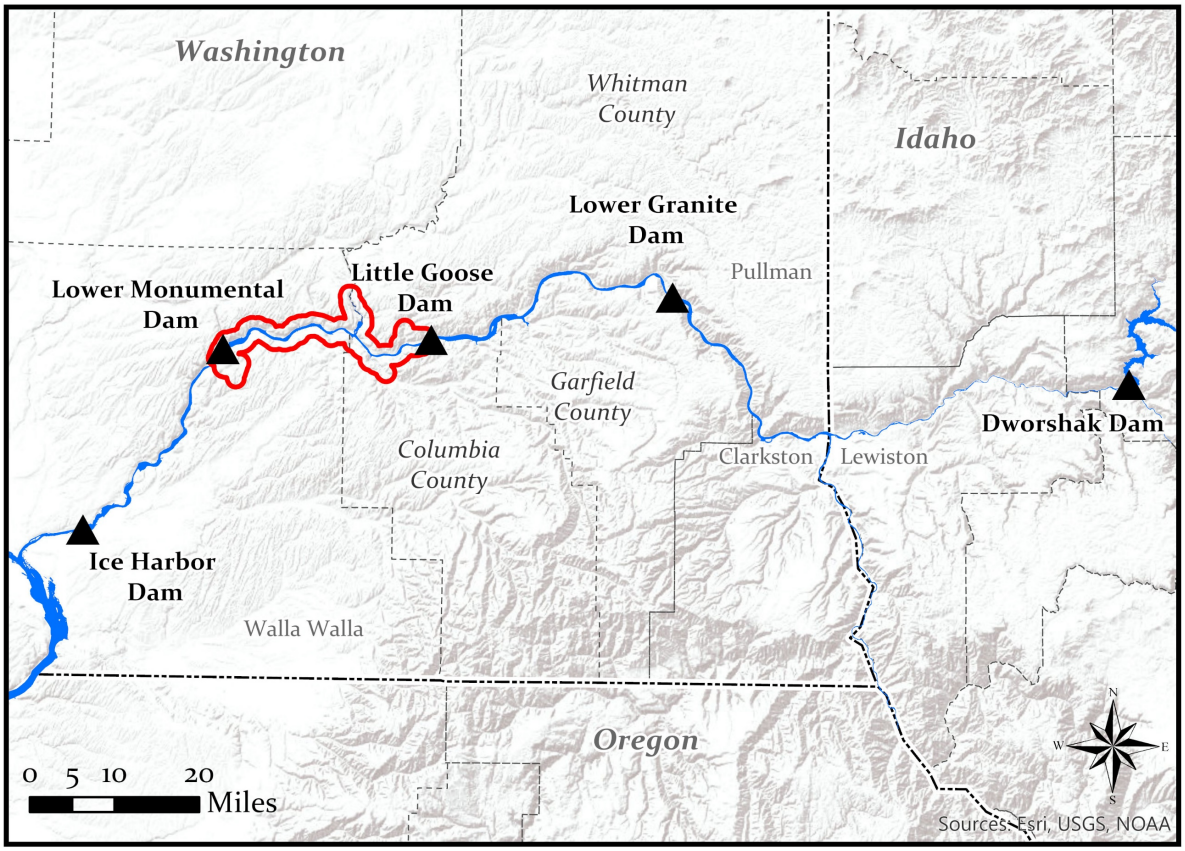

Figure 1-1. Location of Lower Monumental Project

Figure 1-2. Lower Monumental Lock and Dam Aerial View

1.5. PROJECT PERTINENT DATA

Table 1-1. Lower Monumental Lock and Dam Pertinent Data

LOCATION	
State	Washington
Counties	Franklin, Walla Walla, Whitman, and Columbia
River	Snake River
River miles from mouth of Snake River	41.6
River miles upstream from Ice Harbor Dam	31.9
Type of Project	Run-of-river
RESERVOIR	
Name	Lake Herbert G. West
Elevations (Feet Mean Sea Level)	Maximum at dam for spillway design flood 548.3
Minimum at dam for standard project flood	537 to 540
Length, miles	28.7
Length of shoreline	78
Surface area at elevation 540 (low flow, flat pool)	6590 acres

Storage between elevation 537 and 540	20,000 acre feet
DAM	
Length, feet	3791
SPILLWAY	
Total number of bays	8
Overall length (abutment centerlines)	512 feet
Deck elevation	553 ft msl
Ogee crest elevation	483 ft msl

1.6. CONCEPTUAL FRAMEWORK

The process of developing the Lower Monumental Master Plan involved a series of interrelated and overlapping tasks involving the examination and analysis of past, present, and future environmental, recreational, and socioeconomic conditions and trends. With a generalized conceptual framework, the process focused on four primary components:

- Regional and ecosystem needs.
- Project resource capabilities and suitability.
- Expressed public interests that are compatible with the Project's authorized purposes.
- Environmentally-sustainable elements.

The Corps held two scoping meetings in support of the Master Plan revision to give the public opportunities to provide input and ideas. One was held in Dayton, Washington, on August 20, 2019, and the other in Pasco, Washington, on August 21, 2019. The Corps also solicited comments during a 45-day scoping period through a website created for the Master Plan update, through U.S. mail, and via a specialized email address. Recommendations received during scoping helped Corps planners identify opportunities for improved management of Project lands. Those recommendations were considered, along with previous visitor feedback and public use, during formulation and evaluation of the Master Plan.

Information gathered during the scoping period was combined with the detailed Project inventory to form a list of opportunities, constraints, and other influencing factors for

future natural resource and recreation development and management at Lower Monumental Lock and Dam.

From this inventory and input, updated land classifications were applied, and updated land classification maps were created (Appendix C, Land Classification Maps). These maps are used for locating appropriate development and management actions that will be detailed in the Lower Monumental OMP.

1.7. REFERENCES AND DESIGN MEMORANDUMS

Document references can be found in Chapter 9, Bibliography, and a list of all design memoranda pertinent to the Project is furnished in Appendix D, Lower Monumental Project List of Design Memoranda.

2. Project Setting and Factors Influencing Management and Development

2.1. DESCRIPTION OF RESERVOIR, NAVIGATION POOL, AND SHORELINES

Chapter 2 is an overview of the key factors that influence and constrain present and future use, management, and development of land and water resources at Lower Monumental Lock and Dam. These factors fall into three general and interrelated categories: natural resources, historical and social resources, and administration and policy. An analysis of these factors, as well as regional needs and public input, results in a framework to minimize adverse impacts to the environment and resolve competing and conflicting uses. Information presented in this chapter is used to develop Project-wide resource objectives, designate land classifications, and identify other needs.

2.2. HYDROLOGY

The Snake River originates near Jackson, Wyoming, and winds its way 1,078 miles to the confluence with the Columbia River near Pasco, Washington. It is the principal tributary of the Columbia River. The major tributaries to the lower Snake River are the Clearwater, Palouse, and Tucannon Rivers. The Clearwater River, the largest tributary to the lower Snake River segment, historically contributes about 39 percent of the combined flow in the lower Snake River reach (Corps 1995). Flows from the Clearwater, along with releases from upriver Dworshak Dam, make up close to 50 percent of the lower Snake River flows during periods of low flow. Flows in the lower Snake River are highest in the spring (average annual peak of approximately 165,000 cubic feet per second [cfs]) and lowest in late summer (averaging 25,000 cfs). The Lower Monumental watershed includes drainage from the Snake, Palouse, and Tucannon Rivers and Alkali Creek (Figure 2-1).

Figure 2-1. Watersheds of the Snake, Palouse, and Tucannon Rivers Drain into the Lower Monumental Reservoir

2.3. CLIMATE

The climate in this general area is characterized by relatively low precipitation, wide temperature variations, low humidity, high evaporation, and abundant sunshine. Rainfall averages between 10 and 15 inches per year, occurring mostly in the winter and spring. In some years there is no rainfall whatever during some of the summer months.

The mean annual temperature is 52 degrees Fahrenheit (°F). July, the warmest month, has an average temperature of 75°F, an average maximum of 90°F, and an average minimum of 56°F. In January, the coldest month, the average is 30°F. Normally, subzero temperatures occur on only a few days, but in some years there are periods of 2 or 3 weeks of sub-zero temperatures.

Moderate daytime winds, generally from the southwest and with a wind speed of 10 miles per hour or less, blow throughout the year. Occasionally gusty conditions do occur, but the gusts rarely exceed 30 miles per hour. However, on the wheatlands above the reservoir the wind velocities can be considerably higher and, at times, severe dust storms develop.

2.4. TOPOGRAPHY, GEOLOGY, AND SOILS

2.4.1. Topography

On Lake West, the landscape can be seen in the Lower Snake River Canyon where the Cheney-Palouse scabland tract and the Palouse River intersect the Snake River at Lyons Ferry. Also in the Lyons Ferry area, evidence remains of a large, alluvial,delta-like dam that was formed across the Snake River Canyon. This dam was formed when glacial melt-water streams and sporadic floods carried large amounts of material through the Cheney-Palouse scabland tract and deposited it in the canyon. The delta-like dam apparently attained a height of about 1,300 feet in the Lyons Ferry area. The southern abutment of the bridge for State Highway 261 at Lyons Ferry rests on a portion of this ancient alluvial dam. The alluvial dam is still visible, though the railroad and state highway cross the river on bridges nearby.

2.4.2. Geology

The rocks of the Lower Snake River Canyon are primarily basalt, called the Columbia River Basalts, with thin, irregular, sedimentary strata and paleosols occasionally appearing between the flows. A prevolcanic granitic basement complex underlies the Yakima Basalts in the study area.

The Yakima Basalt is the only basalt formation in the Lower Snake River Canyon with some possible overlap into the younger Ellensburg Formations. Potassium argon dating shows the basalt to have emerged about 16 and 13 million years ago from fissure eruptions in which highly fluid lava welled up and spread out from cracks in the earth's surface. Some single lava flows cover thousands of square miles and have volumes of tens or even hundreds of cubic miles. The Yakima Basalt has been dated as Middle Miocene in age, with its uppermost flows having erupted during the early Pliocene.

Figure 2-2. Basalt Outcrop at Ayer Boat Basin

Figure 2-3. Basalt at Ayer Boat Basin

2.4.3. Soils

On the north side of Lake West there are two soil associations. The first is the Starbuck-Roloff-Ritzville Association, which is an area dominated by well-drained soils, some of

which are very deep. Others are underlain by basalt bedrock or sand and gravel at 12 to 36 inches. The second association is the Starbuck-Alpowa Association, an area characterized by silt loams on steep and very steep land, with moderately steep stream terraces. Bedrock outcrops are common on the steep slopes.

On the south side of the reservoir, there are three soil associations. The first of these, the Magallon-Starbuck-Rockland Association, is characterized by soils and rockland formed from material derived from basalt. Bedrock is generally close to the surface.

The second association is the Kuhl-Farrell-Roloff Association, which is dominantly sloping to steep, well-drained, medium-textured and moderately coarse-textured soils, formed on top of wind-deposited silt or glacial outwash. Many of these soils are rocky and underlain by bedrock that is close to the surface.

The third association on the south side of the reservoir is the Walla Walla-Asotin-Chard Association, which is characterized by sloping to steep, well-drained and medium-textured soils that formed in wind-deposited silts. There are bedrock outcrops in places.

Many of the Snake River Plateau soils are light and highly erodible with low rainfall limiting the ability of vegetative cover to reestablish, once removed. Wind erosion is prevalent, especially during the spring and fall, when high winds and dry soil conditions create dust storms (Figure 2-4). The severity of these dust storms is exacerbated by dryland agricultural practices that expose the soil during spring cultivation and fall harvesting.

Figure 2-4. Dust Storm

Erosion from areas burned by wildland fires and soils plowed for agriculture are two of the main factors that contribute sediment to the rivers. The use of no-till farming practices reduces the sediment input from agriculture. Landslides in burned areas contribute large

amounts of sediment. Landslides of various types also occur along the reservoir shorelines. These landslides are generally within the surface layer sediments, especially those that are somewhat poorly drained because of an admixture of finer grained sediment.

2.5. REGIONAL ACCESSIBILITY

Lower Monumental Project is remote, and not located near any major U.S. Highways. Vehicular access to Lower Monumental Lock and Dam and Lake West is limited. There are no roads that are contiguous along the reservoir. The reservoir can only be crossed at Lower Monumental Dam, and on State Highway 261 at Lyons Ferry. Most roads accessing Lake West provide access to only a small portion of the lake. The reservoir can be accessed on the south bank at: Magallon Road, Lyons Ferry Marina, Ayer Boat Basin, and Texas Rapids park. Access on the north bank is available at Lyons Ferry State Park and at Devils Bench.

Commercial air transportation service to the Tri-Cities, Pullman-Moscow Regional, and Walla Walla Regional Airports is available. Private planes occasionally use the landing strip near Lower Monumental Dam. There is no railroad freight service to the Project, nor rail passenger service within the project area.

2.6. RESOURCE ANALYSIS (LEVEL ONE INVENTORY DATA)

There have been many vegetation and wildlife surveys done throughout Project lands over the past 50 years. This inventory data is captured in published and unpublished work as detailed in this chapter. Details on the survey data are summarized in applicable subchapters below.

The Project contains land that supports diverse vegetation that is both actively and passively managed. This land provides habitat for a wide variety of wildlife. The Corps owns and maintains a narrow strip of land along the Snake River that serves as a corridor for wildlife. Existing vegetation, along with mitigation plantings of trees, shrubs, and grasses provide cover and food for foraging fish and animals. There are numerous lowland tributary riparian and wetland areas, allowing for the formation of palustrine forests. The river corridor is typically characterized by grassland or cottonwood and willow riparian species, with shrub-steppe further upland.

Eighteen native and 17 introduced resident fish species are found in the Lower Snake River. Information on the relative abundance of resident fish in the lower Snake River reservoirs suggests that fish community structure is generally similar among reservoirs. Fish presence information was obtained from the Lower Snake River Juvenile Salmon Migration

Feasibility Study – Appendix B (Corps 2002). Reptiles and amphibians were surveyed in 2009 by Alminas et al. (2010). Seasonal avian surveys on HMUs were conducted from 2004 to 2008 (Fischer et al. 2010) and in 2018. Information from these reports is included below.

Vegetation has been described in various reports (Engilis et al. 2010; Fischer et al. 2010). The Corps has planted throughout the Project area, especially in mitigation HMUs, to create and enhance wildlife habitat. More details are presented below in Chapter 2.6.2.

In order to meet mitigation goals under the FWCA and then the LSRFWCP, HMUs were established to replace, repair, and enhance fish and wildlife habitat that was lost due to the construction of the dam and reservoir. These HMUs help create wildlife corridors and vegetation connectivity along the river's edge and surrounding lands. The Corps actively manages the HMUs to control invasive species and enhance the local native habitats through a habitat management contract. Invasive species are a big problem in riparian areas. False indigo, for example, is infesting the shoreline in many areas, as are reed canary grass, purple loosestrife, and phragmites in areas of deposition and shallow water. Invasive species treatment is prioritized annually through on-the-ground surveys conducted by Corps wildlife biologists.

2.6.1. Fish and Wildlife Resources

Native and non-native introduced resident , and anadromous fish species are found in the Snake River. Anadromous fish are born in freshwater, spend most of their lives in saltwater, and return to freshwater to spawn. Fish species are listed in Table 2-1.

Table 2-1. Fish Species Present

NATIVE RESIDENT	NON-NATIVE RESIDENT	ANADROMOUS
white sturgeon	brown trout	Snake River spring/summer Chinook salmon
rainbow trout	common carp	Snake River fall Chinook salmon
kokanee	yellow bullhead	Snake River sockeye salmon
mountain whitefish	brown bullhead	American shad
bull trout	channel catfish	Pacific lamprey
chiselmouth	black bullhead	
peamouth	tadpole madtom	
northern pikeminnow	flathead catfish	
longnose dace	mosquitofish	
speckled dace	pumpkinseed	
redside shiner	warmouth	
bridgelip sucker	bluegill	
largescale sucker	smallmouth bass	
sandroller	largemouth bass	
prickly sculpin	white crappie	
mottled sculpin	black crappie	
Piute sculpin	yellow perch	
	walleye	

Reptile and amphibian surveys were conducted in 2009 at Riparia HMU and Alkali Flat HMU. A total of three reptile and three amphibian species were detected. Species included long-toed salamander, Pacific treefrog, American bullfrog (invasive/non-native), Great Basin gopher snake, terrestrial garter snake, and Northern Pacific rattlesnake. Additionally, western yellow-bellied racer, western toad, boreal toad, and red-eared slider have been observed in the Project HMUs by staff.

Avian surveys between 2004 and 2008 by Fischer et al. (2010) detected 41,175 individual birds of 150 unique species.

Various avian species are getting established outside of their native range and seeing population success within the reservoir systems of the Lower Snake River. Examples include American white pelican, Caspian tern, cormorant, and rock dove. This opportunistic behavior has led to new and developing wildlife management goals for habitat enhancement.

Figure 2-5. American White Pelican

2.6.2. Vegetative Resources

Engilis et al. (2010) and Fischer et al. (2010) described habitats encountered during the mammal inventory as primarily thin strips of riparian grasslands, sparse shrub-steppe, and rock outcrops in shrub and grassland. Riparian corridors generally featured various trees including poplar, alder, dogwood, cottonwood, willows, Rosa sp., and non-natives and invasives such as black locust, Russian olive, and Himalayan blackberry. Emergent wetland vegetation included species such as cattail, bulrush, or reed canary grass (invasive). Grasslands were principally either Basin wildrye or bluebunch wheatgrass. Shrub-steppe was generally gray rabbitbrush with few stands of sagebrush. Cheatgrass was ubiquitous throughout all habitats.

2.6.3. Threatened and Endangered Species

Species listed under the Federal Endangered Species Act that may occur in the Project area are Snake River spring/summer and fall Chinook salmon, Snake River sockeye salmon, Snake River steelhead, bull trout, and yellow-billed cuckoo. The lower Snake River and its tributaries within the Project area contain designated critical habitat for all Endangered Species Act-listed fishes. Each is described in the following paragraphs.

Snake River Spring/Summer Chinook Salmon

Snake River spring/summer Chinook salmon were listed as threatened in 1992 and include all natural-origin populations in the Tucannon, Grande Ronde, Imnaha, Salmon, and mainstem Snake Rivers.

Chinook salmon are anadromous, which means that adults spawn in freshwater streams where juveniles hatch, but then they migrate out to the ocean to grow up to 3 years before returning to their natal stream (where they were born) to spawn as adults. Adult and juvenile spring/summer Chinook salmon generally only migrate through the Project area.

Currently, there are five subbasins in the Snake River (lower Snake River, Tucannon River, Grande Ronde River, Imnaha River, and Salmon River), including 33 watersheds with natural spawning populations (NMFS 2013). A number of limiting factors, including degraded freshwater spawning and rearing habitat, the hydropower system, and harvest, affect these populations.

Snake River Fall Chinook Salmon

Snake River fall Chinook salmon were listed as threatened in April 1992, and reaffirmed April 14, 2014. Historically, the lower and middle Snake River populations formed the two major population groups. However, the construction of Hells Canyon Dam extirpated (made extinct) the middle Snake River population. Spawning populations presently occur in the mainstem Snake River below Hells Canyon Dam, Lower Granite Dam, and in the lower reaches of the Clearwater, Grand Ronde, Tucannon, Salmon, and Imnaha Rivers.

Like other salmon species, fall Chinook are anadromous, but the adults typically spawn later in the fall and at lower elevations in streams and rivers compared to spring/summer Chinook. Juveniles outmigrate slightly later in the summer and are typically younger and smaller than spring/summer Chinook.

There are two types of rearing life history characteristics that have been documented in fall Chinook salmon: ocean type and reservoir type. Ocean type refers to juveniles that outmigrate on a typical schedule to the ocean in the summer. Reservoir type refers to juveniles that begin their outmigration later in the summer, then rear in the lower Snake and Columbia Rivers, where they grow larger and slightly older over winter before completing their migration to the ocean the following spring.

Fall Chinook salmon migrate through the Project area, but reservoir type fall Chinook smolts likely rear in the lower Snake River within the Project area, and a small population of adults typically spawn in the Snake River below the lower Snake River dams.

Snake River Sockeye Salmon

Snake River sockeye salmon were listed as endangered on November 20, 1991. Historically, Redfish Lake in Idaho contained an abundant spawning population of Snake River sockeye. This population was extirpated, but has since been restored to a minimum level. Five other historic lakes in the Stanley Basin and Sawtooth Valley once produced sockeye as well, but the Redfish Lake population is the last remaining (NMFS 2013).

Like other salmon, sockeye salmon are anadromous, but they differ in that spawning and rearing occur in headwater lakes rather than instream. This species is at extremely high risk of extinction due to a lack of abundance, productivity, spatial structure, and genetic diversity. Hatchery propagation efforts have done well providing substantial numbers of fish for supplementation, but survival rates must increase across all life stages to reestablish a sustainable population.

Sockeye generally only migrate through the Project area, but adults have been known to delay below the Project in the summer when high water temperature impedes migration. Sockeye may also seek thermal refuge in the Clearwater River upstream of its confluence with the Snake River.

Snake River Steelhead

Snake River steelhead were listed as threatened on August 18, 1997, and protective regulations were issued under Section 4(d) of the Endangered Species Act on July 10, 2000. Their threatened status was reaffirmed on January 5, 2006, and again on April 14, 2014. This distinct population segment includes populations below natural and manmade impassable barriers in streams in the Snake River basin of southeast Washington, northeast Oregon, and Idaho.

Snake River steelhead are a summer run fish that can enter the Columbia River Basin throughout the year as adults, but typically migrate through the lower Snake River September through November. The adults overwinter in the mainstem Snake and Columbia Rivers, during which time they sexually mature, then complete their upriver migration early the following spring to spawn March and April. Juveniles outmigrate April through May, but unlike Chinook salmon, which outmigrate, typically at 1 year of age or less, juvenile steelhead typically do not outmigrate before age 2 or 3. Adult and juvenile steelhead migrate and rear within the Project area.

Steelhead have generally been referred to as “A-run” and “B-run,” based on two different ocean rearing strategies. A-run fish generally spend only 1 year in the ocean before returning, and they are smaller than B-run fish, which spend 2 to 3 years in the ocean before returning to freshwater. While A-run fish are also found throughout most of the

Snake and Columbia River Basins, research has shown that B-run fish are strictly from the Clearwater and Salmon River Basins (NMFS 2017).

Another life history characteristic separating steelhead from other anadromous salmon is iteroparity, or the ability to spawn more than once. While all other salmon species return to freshwater, spawn, and then die, steelhead may return to the ocean again, or remain in the freshwater rivers to spawn again.

Steelhead typically migrate through the Project area, but they may also overwinter in Lake West prior to completing their spawning migration.

Bull Trout

The U.S. Fish and Wildlife Service (USFWS) issued a final rule listing the Columbia River Basin population of bull trout as a threatened species on June 10, 1998. Bull trout are currently listed throughout their range in the western United States as a threatened species. Historically, bull trout were found in about sixty percent of the Columbia River Basin. They now occur in less than half of their historic range. Populations remain in portions of Oregon, Washington, Idaho, Montana, and Nevada (USFWS 2010).

Migratory bull trout spawn in headwater streams along with resident bull trout. Their juveniles rear from 1 to 4 years before migrating downstream to mainstem river habitats as sub-adults. Migratory adult bull trout spawn in September through October, then migrate downstream to overwintering areas from October through December after spawning, and then begin their return migration to the headwaters during May and June.

Migratory sub-adults may overwinter in creek and river mainstems for several years before returning to the headwaters once sexually mature. Resident and migratory forms may be found together, and either form may give rise to offspring exhibiting either resident or migratory behavior. Both sub-adult and adult bull trout likely use the lower Snake River during the fall, winter, and spring for rearing and overwintering, although the proportion of local populations that may do this is unknown.

Western Yellow-Billed Cuckoo

The western distinct population segment (west of the continental divide) of the yellow-billed cuckoo was listed as threatened under the Endangered Species Act on October 3, 2014. Critical habitat has been proposed; however, Washington is not included in the critical habitat designation. These birds prefer open woodlands with clearings with a dense shrub layer. They are often found in woodlands near streams, rivers, or lakes, but yellow-billed cuckoos occur most frequently and consistently in cottonwood (*Populus spp.)* forests with thick willow understory (Taylor 2000). They typically require an understory of 75

percent cover over a minimum of 10 acres. In winter, yellow-billed cuckoos migrate to tropical habitats with similar structure, such as scrub forest and mangroves. Individuals may be on breeding grounds between May and August.

In the Pacific Northwest, the species was formerly common in willow bottoms along the Willamette and Columbia Rivers in Oregon, and in the Puget Sound lowlands and along the lower Columbia River in Washington. The species was rare east of the Cascade Mountains. It may now be extirpated from Washington (USFWS 2008).

Lower Monumental Lock and Dam lands lack the required plant cover density to support yellow-billed cuckoos. No yellow-billed cuckoos have been documented in the Project area, and given the lack of required habitat, none are expected to be in the area.

2.6.4. Invasive Species

In accordance with Executive Order (EO) 13112, an invasive species is defined as an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species may be accidentally transported or deliberately introduced because they are thought to be helpful in some way. Nuisance, noxious, pest, and invasive species exist across the project, including avian, fish, and vegetative species. Often these are non-native species that have a special competitive advantage in this area, and little natural pressure from predators and/or other species that keep the species in check. Management of invasive species can be extremely expensive and complicated. Therefore, the Corps uses an integrated pest management approach for all pest control. Vegetation in the Project area includes a wide array of invasive, noxious, nuisance, and pest species. These species can impact Project operations, reduce habitat value, and impact recreation.

There are aquatic invasive fish species and nonnative sport fish that impact the ecological system and species abundance and success; however, the management of these are outside of Corps authority and jurisdiction. The Corps cooperates with the State of Washington to address these when feasible and funded.

The Corps does manage various animals, both native and non-native, nuisance species in compliance and coordination with the State of Washington and the National Oceanic and Atmospheric Administration, USFWS, and the United States Department of Agriculture. These animals are typically causing a nuisance and disrupting other native species such as salmon populations, operations of the project, or establishment of native habitats.

Terrestrial plants including reed canary grass, false indigo, purple loosestrife, and phragmites are becoming more and more of a management issue for the Project and are requiring more focused efforts, both in upland and riparian areas. False indigo, for example,

is infesting the shoreline in many areas, outcompeting native willow species in many cases, and even blocking access to the river. Reed canary grass has taken over areas of siltation and portions of irrigated HMUs, out-competing other native riparian vegetation. Phragmites can occur in areas of deposition or shallow water. The Corps manages invasive species, within budgetary constraints, in accordance with the District's Integrated Pest Management Program (Corps 2019b) for Project operations, natural resource management, habitat management in HMUs, and recreation management.

2.6.5. Ecological Setting

The Natural Resource Management Mission of the Corps (Engineer Regulation [ER] 1130-2-550, Chapter 2, Paragraph 2-2.a.(1), dated November 15, 1996) states the following:

> *The Army Corps of Engineers is the steward of the lands and waters at Corps water resources projects. Its Natural Resource Management Mission is to manage and conserve those natural resources, consistent with ecosystem management principles, while providing quality public outdoor recreation experiences to serve the needs of present and future generations.*
>
> *In all aspects of natural and cultural resources management, the Corps promotes awareness of environmental values and adheres to sound environmental stewardship, protection, compliance, and restoration practices.*
>
> *The Corps manages for long-term public access to, and use of, the natural resources in cooperation with other Federal, State, and local agencies as well as the private sector.*
>
> *The Corps integrates the management of diverse natural resource components such as fish, wildlife, forests, wetlands, grasslands, soil, air, and water with the provision of public recreation opportunities. The Corps conserves natural resources and provides public recreation opportunities that contribute to the quality of American life.*

The Corps is one agency of several federal agencies, state agencies, and non-governmental organizations that are responsible for managing resources in the same geographic area. To help achieve consistency with natural resource management across these organizations, the Environmental Protection Agency (EPA) delineated and designated ecoregions across the United States. Ecoregions are areas where ecosystems (and the type, quality, and quantity of environmental resources) are generally similar (EPA 2018). The Columbia Plateau ecoregion is a Level III ecoregion designated by the EPA encompassing approximately 35,000 square miles of land within Washington, Oregon, and Idaho (Wiken, Nava, and Griffith 2011). In support of the Corps natural resource management mission,

and to provide a larger-scale context of the resources managed in the region, the following paragraphs describe the Columbia Plateau ecoregion in which the Project area falls.

- Location. The Columbia Plateau ecoregion ranges between the Cascades to west and Rocky Mountains to the east. An ecoregion is a major ecosystem defined by distinctive geography and receiving uniform solar radiation and moisture. The Project area is in southeastern Washington.

- Climate. The ecoregion has a dry, mid-latitude desert and steppe climate. It is marked by hot, dry summers and cold winters. The mean annual temperature ranges from approximately 44°F to 53°F. The frost-free period ranges from 70 to 190 days. The mean annual precipitation ranges widely from about 6 to 23 inches with an average of about 13 inches.

- Vegetation. This ecoregion is characterized by shrub-steppe and grasslands, which consist of bluebunch wheatgrass, needle-and-thread grass, Sandberg bluegrass, and Idaho fescue. Big basin sagebrush, Wyoming big sagebrush, and antelope bitterbrush are also common. Invasive cheatgrass encroaches on some large areas, and Common rye is also becoming quite a problem, with expanding monocultures displacing native vegetation.

- Hydrology. Streams originating in the area are generally ephemeral (temporary) and may only flow several days per year, if at all. Most summer precipitation is evaporated or transpired. Perennial streams and rivers originate in adjacent mountainous ecoregions. Some wetlands and marshes occur, but many have been drained for agriculture.

- Terrain. The terrain consists of tablelands of moderate to high relief and irregular plains with open hills. Elevations range from about 196 feet where the Columbia River exits the region to the west, to over 4,900 feet on some hills in the east. Episodic geologic events such as lava flows and massive floods shaped the topography. This region is one of the best examples of plateau flood basalts, and many areas are underlain by basalt over 5,800 feet thick. Deep loess soils covered much of the plateau. Pleistocene floods cut through the thick deposits of windblown soil, leaving islands of loess separated by scablands and bedrock channels.

- Wildlife. Common wildlife includes species such as Rocky Mountain elk, white-tail and mule deer, coyote, cougar, black-tailed jackrabbit, ground squirrels, American kestrel, bald and golden eagle, osprey, red-tailed hawk, great horned owl, western meadowlark, sage thrasher, savanna sparrow, and rattlesnake, among others.

Figure 2-6. White Tail Deer

Figure 2-7. Great Horned Owl and Owlets

- Land Use and Human Activities. This ecoregion includes cropland with dryland and irrigated agriculture, rangeland for livestock grazing, and wildlife habitat. Some areas are extensively cultivated for winter wheat, particularly in the eastern portions of the region where precipitation amounts are greater. Other crops include barley, alfalfa, potatoes, onions, hops, lentils, and dry peas. Fruit orchards and vineyards are extensive in some areas. Some areas are military and restricted government land. Some areas are tribal land. Larger cities include Yakima, Richland, Kennewick, Pasco, Walla Walla, Hermiston, Pendleton, and The Dalles.

2.6.6. Wetlands

In contrast to riparian habitats, which usually have water saturated soils during flood events, wetlands generally occur where groundwater saturates the surface layer of soil during a portion of the growing season, often in the absence of surface water. This water remains at or near the surface of the substrate for periods of sufficient duration and frequency to induce the development of characteristic vegetative, physical, and chemical conditions (16 USC Sec.440b Title 16, ch. 64).

Wetlands along the river and inside stream deltas serve a variety of physical and biological functions including: wildlife habitat (waterfowl, big game, furbearers, etc.), fish breeding and foraging habitat, nutrient/sediment trapping, flood control, and recreation.

The amount and occurrence of emergent wetland vegetation has increased since the four dams were constructed, from about 10 acres in 1958 to 353 acres currently. Additionally, numerous small pockets of wetland vegetation, less than one-half acre in size, exist in small impoundments behind roads and railroads and small embayments. Vegetation is dominated by cattail and softstem bulrush with some rushes and sedges. The increase in emergent wetland communities is likely due to several factors:

- Abundant slack water which causes sediments carried into reservoirs to accumulate and create good conditions for wetland vegetation development, especially at the mouths of tributaries;
- Several embayments and backwaters which also allow wetland development;
- Drawdowns which allowed wetland vegetation to establish; and
- Runoff and seeps from nearby irrigated HMUs.

2.7. CULTURAL RESOURCES AND CONTEXT

There is ample evidence that native people lived along the Snake, Palouse, and Tucannon Rivers in the Project area for thousands of years. Their ongoing presence is indicated through oral history provided by descendants of the Native American inhabitants, allotment and homestead records, ethnographic research, museum collections, and from archaeological site investigations. The archaeological sites found on Project lands and throughout the region represent a full range of lifeways, including plant, animal, and toolstone procurement, food processing and storage, rock imagery, ceremonial aspects, and habitation sites ranging from small camps to large villages. These areas not only represent long ago activities, they are still of living importance today to several Tribes. A number of

historic period sites are also present, including those related to agriculture, transportation, industry, and homesteads.

An overview and historic context for Lower Monumental Lock and Dam and other projects in the Federal Columbia River Power System (FCRPS, a subset of which is now known as the Columbia River System), is discussed in a number of documents and is not detailed in this document (Historical Resource Associates, Inc., 2015, Reid 1995). The FCRPS is a series of hydroelectric power projects in the Columbia River Basin located on the mainstem Columbia River and in several of its major tributaries that provide about one-third of the electricity used in the Pacific Northwest.

The Project area is part of the homeland of multiple Tribes, including the Confederated Tribes and Bands of the Yakama Nation (Yakama), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), the Confederated Tribes of the Colville Reservation (Colville), the Nez Perce Tribe, and the Wanapum band. Important camps and village sites are found along the Snake, Palouse, and Tucannon Rivers, as well as locations used for fishing, hunting, and gathering of food, medicines, toolstones, and other resources (Hunn et al. 2015, Scheuerman and Trafzer 2015, Nez Perce Tribe 2003). The river forms an important travel corridor, and trails lead through and across Corps land to the prairies and high country where resources were found at different times of the year. Salmon and other fish were and continue to be an important source of food to all of these Tribes. Salmon were caught during different fish runs along the major rivers and their tributaries, caught using a variety of fishing methods, including spears, leisters, nets, and often platforms. Tribal members lived along the rivers into the twentieth century, and in some cases the Corps acquired land from tribal owners at the time of dam construction. In and surrounding project lands, there are landscape features that have tribal stories associated with them, or in some cases, names that have been carried over in to the modern lexicon. The words Palouse, Tucannon, Texas Rapids, Khalotus, etc. originate from languages spoken by the earliest inhabitants of the region.

The Nez Perce Tribe, or Nimiipuu, occupied a territory measuring over 13 million acres. Their territory extended east to the Bitterroot Mountains, and with forays into Montana for bison hunting; and south into the Clearwater River Basin and South and Middle forks of the Salmon River Basin in Idaho, and west along the Snake River in Oregon and Washington, and forays to large fishing centers on the Columbia (Cannell 2000:14). The Nez Perce lived in camps and permanent villages along rivers and streams, with named Nez Perce villages are found along the Snake to the confluence with the Columbia River, and as far south as Weiser, Idaho. They speak a Sahaptian language, sharing language and cultural similarities to other Sahaptian speakers in Oregon and Washington (Walker 1998:420).

The Tribes that reside on the reservation of the CTUIR today comprise three groups, the Umatilla and Walla Walla, who speak Sahaptin language dialects (Columbia River Sahaptin, Northeast Sahaptin), and the Cayuse, who spoke a different language altogether (Stern 1998:395; Hunn et al. 2015:18). The Umatilla people lived on both sides of the Columbia between the Tri-Cities in Washington and the Blue Mountains in Oregon, while the Walla Walla were located along the Columbia and lower Snake River near the Tri-Cities, extending to the mouth of the Walla Walla River. The Cayuse were largely along smaller rivers and creeks located inland from the Snake and Columbia Rivers, east into the Blue Mountains (Stern 1998:395-396). The original homeland for the CTUIR encompassed some 6.4 million acres, with a wider use area that roughly doubled that area, extending along the Columbia River downstream to major fishing centers, and after acquisition of the horse, east into Montana for bison hunting (Hunn et al. 2015:49).

The Yakama comprise 14 constituent tribes, including the Yakama, Palouse, Pisquouse, Wenatshapam, Klikitat, Klinquit, Kow-was-say-ee, Li-ay-was, Skin-pah, Wishram, Shyiks, Ochechotes, Kah-milt-pah, and the Se-ap-kat (Foster Wheeler et al. 1999:44). They are speakers of Sahaptin language dialects, and include tribes living in central Washington, largely bounded by the Columbia River to the south and the east, along the Yakama River, and into the grassy foothills and forested mountains on the east flank of the Cascade Range (Schuster 1998:328). People would also travel to the plains for bison hunts after acquisition of the horse. The people of the 14 tribes followed a seasonal round, living in large winter villages, then transitioning to summer camps to hunt, gather roots and other plant foods, and meet with neighbors.

The Colville today comprise twelve tribes, including the Chelan, Chief Joseph Band of Nez Perce, Colville, Entiat, Lakes, Palus, Methow, Moses-Columbia, Nespelem, Okanogan, Sanpoil, and Wenatchee (George 2003:4). These tribes originate from an area during the precontact period covering northeastern Washington (Chelan, Colville, Entiat, Methow, Moses-Columbia, Nespelem, Sanpoil, Wenatchee), southeastern Washington (Palus), northeastern Oregon (Chief Joseph Band of Nez Perce), and northern Washington/south-central British Columbia (Lakes, Okanogan) (Miller 1998:254; Kennedy and Bouchard 1998:240). The Chief Joseph Band of Nez Perce are from northeastern Oregon, occupying valleys along major river corridors, and conducting hunting and gathering activities in the summer months at the higher elevations. The Palus people are from along the lower Snake River between its confluence with the Clearwater River, downstream to the Snake confluence with the Columbia River, as well as the grasslands to the north. The Nez Perce and Palus both speak Sahaptin language dialects.

Horses were first acquired in the 1730s, which had a marked impact on tribal ways of life. Euro-American diseases began to arrive in the 1700s, causing many deaths. On October 12 and 13, 1805, explorers with the Corps of Discovery, led by Lewis and Clark, camped near Riparia and Monumental Rock (Plamondon II 2001). They were soon followed by fur traders, missionaries, and white settlers. The Army briefly established a fort at the mouth of the Tucannon River, and the Mullan Road, a military travel route between Fort Walla Walla and northeastern Washington, crossed the Snake River near Lyons Ferry. Settlers established homesteads on the productive grasslands and river bottoms.

In 1855, three treaties were signed in Walla Walla, Washington between the U.S. and Tribal Nations. The boundaries for the three treaties converge in the Project. The 1855 treaty with the CTUIR includes land along the south side of Snake River, from the Tri-Cities area to the Tucannon River. The Nez Perce Treaty includes lands along the east side of the Palouse River, north of the Snake River, and east of the Tucannon River on the south side of the Snake River. The treaty with the Yakama includes lands on the north side of the Snake River, and west of the Palouse River. It took many years for tribal people to move to reservations and receive the resources promised in the treaties. In the meantime, settlers continued to encroach on tribal lands, reservation boundaries were revised in subsequent treaties, and wars, skirmishes, and resources that were important for tribal people were severely depleted or claimed and access restricted.

During the reservation period some Palus people claimed and remained on allotment/homestead claims along the Snake River, while most others moved or were relocated to reservations, including the Yakama, Nez Perce, Colville, Umatilla, and others (Sprague 1998:357). During the Indian Claims Commission Hearings in 1963 the Colvile identified and received a settlement for the Palus, relating to territory that the court identified as having been exclusively used and occupied by the Palus (12 Indian Claims Commission 301 Docket No 161). This area is located along the north side of the Snake River, from Devils Canyon (near Lower Monumental Lock and Dam) to Wawawai (near Lower Granite Lock and Dam).

Early Cultural Resources Surveys

Euro-American explorers, missionaries, and ethnographers reported on their interactions with the Cayuse, Nez Perce, and Palus people living in the Project area throughout the 1800s, and into the 1900s. The Smithsonian Institute's River Basin Surveys program in the 1940s kicked off cultural resources management at the Project with an archaeological survey. The surveyors noted that extensive looting had already taken place at many sites. They recorded 10 archaeological sites and one paleontological site, and recommended further work at four sites (Osborne 1948). The archaeologists during that survey relied on

local informants who helped to identify the most well known archaeological sites. Several excavations were then funded by the National Park Service during the 1950s and 1960s. Work was conducted by archaeologists from Washington State University (WSU), at Three Springs Bar, the Trestle Site, and Squirt Cave.

The largest excavations by far during the 1960s were at Palus Village and Marmes Rockshelter. These investigations were funded at first by the National Park Service, and then later by the Corps. At Palus Village, archaeologists removed an entire cemetery representing 251 relatively recent burials (circa 1840-1910, with one dating to 1944), including the remains of many children, with high numbers indicating deaths due to spread of Euro-American diseases (Schalk and Nelson 2016:60). At Marmes Rockshelter, archaeologists excavated through 11,000 years of archaeological deposits, including not only human burials, but also remnants of storage and living areas (Hicks 2003). Excavations in the Project area continued into the 1970s to 1990s, including when archaeological sites were found to be in the path of fish hatchery and recreation site development, or were being disturbed by looting or reservoir related erosion. While considerable effort is represented in the early investigations, there are undoubtedly many undocumented sites located under the waters of the reservoir, since most of effort prior to inundation was concentrated at less than a dozen better known sites.

Figure 2-8. Marmes Rockshelter Excavation, 1969

Small communities at Ayer, Texas City (now known as Riparia), and Lyons Ferry were affected by the rising reservoir waters, as were numerous homesteads, ranches, and farms. Historical archaeological resources have been investigated as well. The historical archaeological deposits associated with construction of the Joso Trestle were excavated near Lyons Ferry in the late 1970s. Archaeological investigations were conducted at Texas City in the 1980s, formerly the largest town along the lower Snake River between Pasco and Clarkston.

In 1997, funding was made available for Lower Monumental cultural resources management under the FCRPS Cultural Resources Management Program. Cultural resources have been affected by ongoing effects related to operation and maintenance of the dams, as formally acknowledged by the Corps in the FCRPS Programmatic Agreement (BPA, et al. 2009). Examples of these ongoing effects include erosion, sediment deposition, development, and recreational activities. Sites have also been affected by unauthorized actions, such as vandalism, looting, and cattle encroachments. Program accomplishments include completion of the 2000 Cultural Resources Management Plan (Hicks 2000), ongoing surveys of Corps-managed lands to document archaeological sites and Traditional Cultural Properties (TCPs), site condition monitoring, evaluation of sites to determine eligibility for the National Register of Historic Places (NRHP), management and analysis of archaeological collections and records, and shoreline stabilization.

The Payos Kuus Cuukwe Cooperating group was formed to exchange views, technical information, and planning advice to achieve compliance with the National Historic Preservation Act (NHPA). Membership includes representatives from:

- Federal agencies
    - The Corps
    - BPA
- Tribes
    - Confederated Tribes of the Colville Reservation (Colville)
    - Confederated Tribes of the Umatilla Indian Reservation (CTUIR)
    - The Confederated Tribes and Bands of the Yakama Nation (Yakama)
    - The Nez Perce Tribe
    - The Wanapum Band
- State Historic Preservation Officers (SHPO) in Idaho, Washington, and Oregon.

Most of the Project land located above high water was archaeologically surveyed or resurveyed during four surveys occurring in 1988, 1993, 2000, and 2012 (Draper and Brauner 1989, Hicks 1994, Miller 2001, Schalk et al. 2013). At this time, about 6,700 acres

have been surveyed at the Project. Underwater surveys have not been prioritized at this time due to poor underwater visibility, high cost, and the ongoing needs for work on lands and sites that are not inundated. Other surveys, documentation, and excavations have been conducted prior to proposed development, maintenance, or habitat management projects. Archaeological sites are visited on a regular basis to determine if they have been harmed by natural, visitor, or Corps actions. The Corps has archaeologists on staff that conduct cultural archaeological surveys, write reports, and contract with private or Tribal cultural resources management firms as needed to comply with federal law regarding agency cultural resources responsibilities under NHPA.

The NHPA requires that the Corps identify and evaluate historic properties for listing on the National Register of Historic Places, and that the agency consider the effects to historic properties from activities (also called undertakings). Historic properties include districts, sites, buildings, structures, and objects. Eligible properties would typically be greater than 50 years old and have an association with an important event, person, interesting architecture, or in the case of archaeological sites, have the potential for further study. Numerous historic properties have been identified at Lower Monumental, including archaeological sites, an archaeological district, TCPs or Historic Properties of Religious and Cultural Significance to Indian Tribes, several structures, and objects.

There is one listed National Historic Landmark at Lower Monumental; Marmes Rockshelter, and the NRHP-listed Palouse Canyon Archaeological District. These listed properties represent a continuum of Native American occupation of the area, from the Windust phase to the contact period. There are 189 documented archaeological sites and 18 isolated finds located on Project lands. These include 163 precontact sites, 26 historic sites, and 2 multicomponent sites that date to the precontact and historic periods. The precontact sites include about a dozen camp and village sites, numerous burials and cemeteries, and a large number of rock features, including rock imagery, rock cairns, and rock shelters. The historic sites represent transportation related activities, including the former Lyons Ferry that traversed the Snake River near the Palouse River confluence; railroad lines, communication lines, and a railroad construction camp. The historic sites also include remnants of fencing, agricultural features, and the historic town of Texas City. Several historic towns and railroad sidings including the town of Ayer were inundated as the reservoirs filled. While reservoir clearing and relocation activities meant most above ground buildings and structures were removed, remnants of those resources may still be present under the reservoirs.

Under the NHPA, the Corps is responsible for examining the sites on its land and seeing if they are significant, and meet criteria for listing on the NRHP. Nineteen archaeological sites at Lower Monumental have been formally listed on the NRHP, and another 88

archaeological sites have been found eligible through in agreement with the SHPO, but have not been formally nominated to the NRHP. Five archaeological sites have been found not eligible for the NRHP, and 81 sites have not been evaluated. Many of the unevaluated sites are inundated and have not been evaluated because only limited information is available since they cannot be physically visited.

TCPs, which includes Historic Properties of Religious and Cultural Significance to Indian Tribes, are areas tied to beliefs, customs, and practices of a living community. They may coincide with the boundaries of archaeological sites or be comprised of a number of landscape features. TCPs have been identified at Lower Monumental by the Colville, the CTUIR, the Nez Perce Tribe, the Yakama, and the Wanapum band. One joint nomination has been prepared by the Corps, with contributions from the tribes, for the Palus Village/Canyon TCP. The Colville, CTUIR, Yakama, and Nez Perce have all prepared at least one study discussing TCPs at Lower Monumental, and some of the Tribes have prepared forms and conducted preliminary eligibility review, while others will be evaluated for NRHP eligibility in the future.

Historic built resource, including buildings, structures, and objects, have been documented to a limited extent on project lands. In 1969, the Lower Monumental Dam exterior structure was completed, and the reservoir behind it was filled, meaning that the dam is now over 50 years of age. The dam was concurred eligible for listing on the NRHP by the Washington SHPO in 2020. Other structures, including one BPA substation, the Joso Trestle, an Inland Power transmission line, and the Snake River Bridge/Lyons Ferry Bridge have also been documented, but these four resources are managed by other entities. Two objects, including a monument at Lyons Ferry Park, and the Lyons Ferry , are located on Corps land. The Lyons Ferry was relocated to Lyons Ferry park after creation of the reservoir and construction of the bridge. The Ferry is an eligible historic object, and served as a popular fishing platform for many years, but has sat in a state of disrepair for the past 20 years. A local group has advocated for preservation of the Ferry, and the Corps and State Parks acknowledge that it is a important resource, but funds for rehabilitation work are unavailable at this time.

Figure 2-9. Lyons Ferry, 1965

Figure 2-10. Lyons Ferry, 2018

The Corps has a responsibility to care for collections and records resulting from cultural resources studies. 36 Code of Federal Regulations (CFR) Part 79, "Curation of Federally Owned and Administered Archaeological Collections," outlines minimum standards for appropriate, long term care of federal archaeological collections. Artifacts, samples, records, and reports associated with studies at Lower Monumental are curated at the Washington State University in Pullman, Washington. At this time, there are 1,476 cubic feet of artifacts and 69 linear feet of records. The collections are available for study by qualified researchers.

In summary, evidence of thousands of years of human prehistory and history are represented at Lower Monumental Project. The area contains great cultural significance to numerous Tribes. The Corps will continue to document historic properties as they are

found, and evaluate them for effects from ongoing and proposed activities in consultation with WSU Department of Archaeology and Historic Preservation and the Tribes.

2.8. RECREATIONAL FACILITIES AND ACTIVITIES

The Project provides a variety of water-related and land-based recreation opportunities. While use of Project recreation opportunities is currently low relative to other regional recreation areas, we expect the demand for recreation activities in the future will increase. If usage of the Project increases dramatically without corresponding facility expansion, it could change the current user experience and negatively impact Project resources.

2.8.1. Recreation Use

Water-Based Recreation

Boating on Lake West is a primary activity for many visitors. Much of the boating is related to fishing; however, waterskiing, tubing, wake boarding, jet skiing, sailing, kayaking, and canoeing are also important boating activities. Virtually the entire length of the reservoir is designated as part of the Northwest Discovery Water Trail, a 367-mile recreational boating route on the region's defining waterways. It begins at Canoe Camp on the Clearwater River in Idaho, follows the Snake River down to the Columbia River, and ends at Bonneville Dam in the Columbia River Gorge. The trail connects nearly 150 sites to launch your boat, picnic, or camp along these rivers when you travel by motorboat, canoe, sailboat, or kayak.

Additionally, boating provides an efficient means of transportation and allows hunters to gain access to more remote HMUs, many of which have no vehicle access at all. Access to the 29-mile long lake is gained through 6 boat ramps providing access to Lake West. Boat ramps are located at Lyons Ferry State Park, Lyons Ferry Marina, Ayers Boat Basin, Devils Bench and Texas Rapids Park, and a primitive boat launch at Riparia Park. Day use slips and 84 long-term slips are available at Lyons Ferry Marina.

Fishing draws the greatest amount of visitors to Lake West. Most anglers fish for pikeminnow, steelhead, hatchery spring/summer Chinook salmon, smallmouth bass, and when a season is allowed by State agencies, hatchery fall Chinook salmon. There is an active recreational walleye fishery at the confluences of the Tucannon and Palouse Rivers.

During the hot summer months, swimming is a popular activity. The only designated swimming area is at Lyons Ferry State Park.

Camping

Developed camping sites are limited to approximately 40 RV/tent sites at Lyons Ferry Marina. Lyons Ferry State Park is no longer used for camping, though Washington State Parks is currently considering updating and reopening the area for camping. Primitive camping is available at various sites along the river, such as at Texas Rapids and Riparia.

Hunting

Hunting is small percentage of the visitation at Lake West. In 2016, hunting accounted for only 1 percent of visitation, but actual numbers are likely quite a bit higher given the lack of accessibility and difficulty accounting for hunters accessing the area from upland routes. Vehicle and trail counters on many HMUs are lacking, and many hunters access Corps lands after departing from boat ramps managed by other agencies. Therefore, it is very difficult to determine accurate visitation to most Project HMUs.

White-tailed and mule deer are the primary big game species. Upland game bird hunters target turkey, pheasant, chukar, California quail, and mourning dove. Waterfowl hunting is fairly common and takes place in December and January. More than 6,900 acres of Project lands are open to public hunting. Excluding operations lands, recreation lands, and lands near populated areas, most Corps lands are available to hunters.

Picnicking

Picnic tables and shelters are located at Lyons Ferry State Park, Devils Bench, Ayer Boat Basin, Riparia, and Texas Rapids, with smaller numbers at remote locations. Additional picnic tables and shelters are planned at Ayer Boat Basin and at Devils Bench. Picnic facilities will meet current demand with normal use.

Trails

The Project provides more than 16 miles of land-based recreation trails. Trail surfaces include pavement, gravel, and dirt. The gravel or dirt trail system allows for hiking, mountain biking, and equestrian use.

2.8.2. Zones of Influence

The concentration and distribution of the population surrounding the Project are major influences on land classification and recreation development. This is illustrated with zones of influence. Figure 2-11 identifies the Lower Monumental Lock and Dam zones of influence.

Primary

The primary area of influence encompasses the area within 25 miles of the Project. There are no major cities within a 25 mile drive of Lower Monumental Dam and Lake West. This area does include small nearby towns like Dayton, Waitsburg, Pomeroy, Kahlotus and Washtucna, Washington and the rural population in this vicinity.

Secondary

The secondary zone of influence for the Project is the area within a 50-mile radius of the Project that is not included as part of the primary zone of influence. This area is within 1-hour traveling time from the Project. This area includes Pasco, which is 40 miles from Lower Monumental Lock and Dam. The cities of Richland and Kennewick are nearby, with a combined metropolitan population of around 300,000. This also includes Walla Walla and College Place, Washington and Milton-Freewater, Oregon, with combined population of more than 50,000. Additionally, the micropolitan areas of Clarkston, Washington and Lewiston, Idaho (combined population 40,000) and Pullman, Washington and Moscow, Idaho (combined population 60,000) are within this zone. There is a significant rural population in this area as well.

Tertiary

The tertiary zone of influence is outside of the 50-mile radius, up to 100 miles from the Project. Some visitors will travel up to 2 hours to the Project. This area includes Spokane, Washington with a metropolitan population in excess of 600,000, and which is 106 miles from Lyons Ferry State Park. Hermiston, Pendleton, and La Grande, Oregon (population in these three cities exceeds 47,000) fall in this zone, as does Yakima, Washington (population 93,000). When the original Lower Monumental Master Plan was written in 1966, it was estimated that the population within a 75-mile radius would exceed 500,000 in 2018 – an estimate that has proved true.

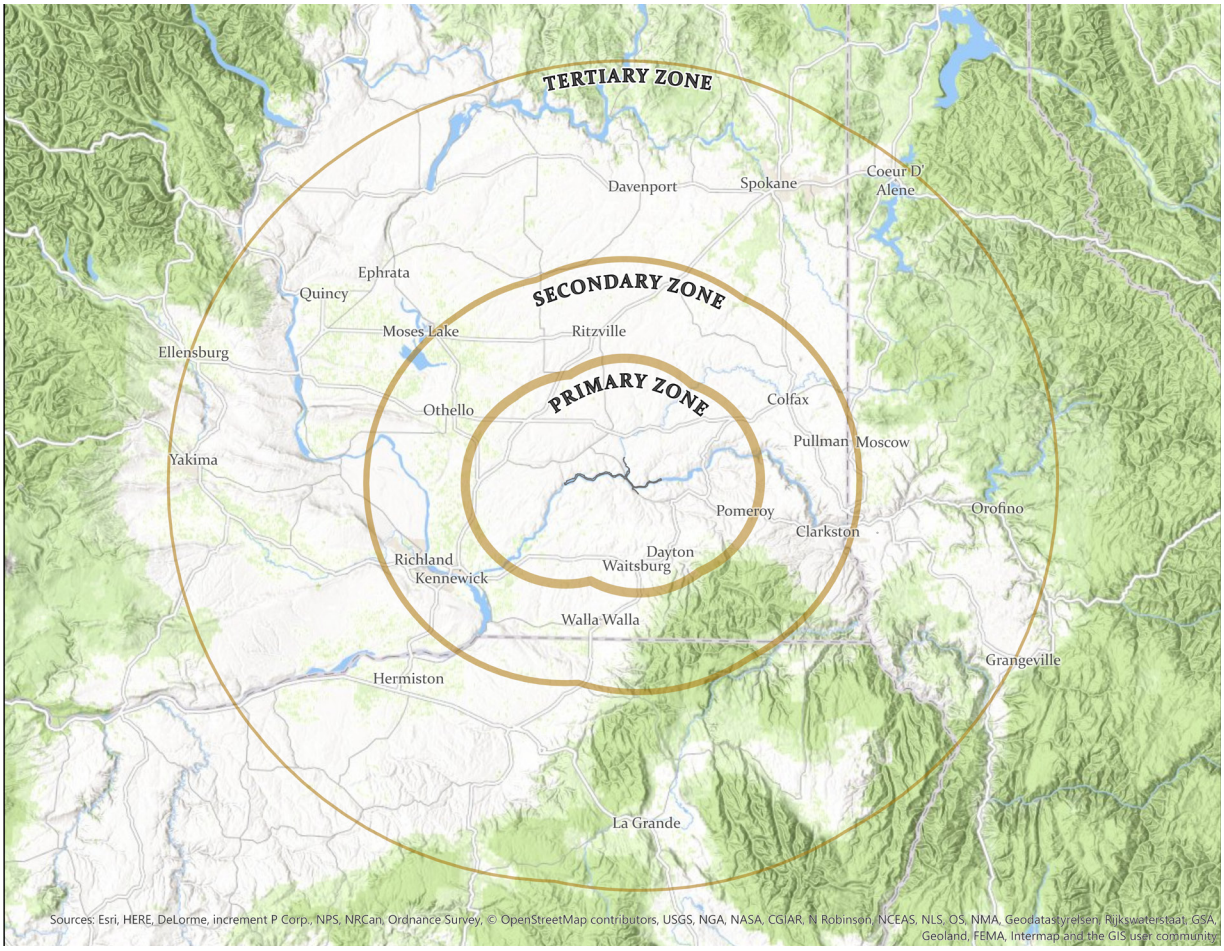

Figure 2-11. Lower Monumental Lock and Dam Zones of Influence for Project Visitation

2.8.3. Project Visitation Profile

Seasonal visitation is strongest from May through July, with a peak visitation in July for the Project. Visitation steeply declines in October, and winter visitation low is November to March. However, as noted in the discussion in the previous subchapter, accurate visitation numbers are not available for most of the Project's HMUs, so a higher percentage of visitation occurs at the HMUs than is captured in the data in Figure 2-12.

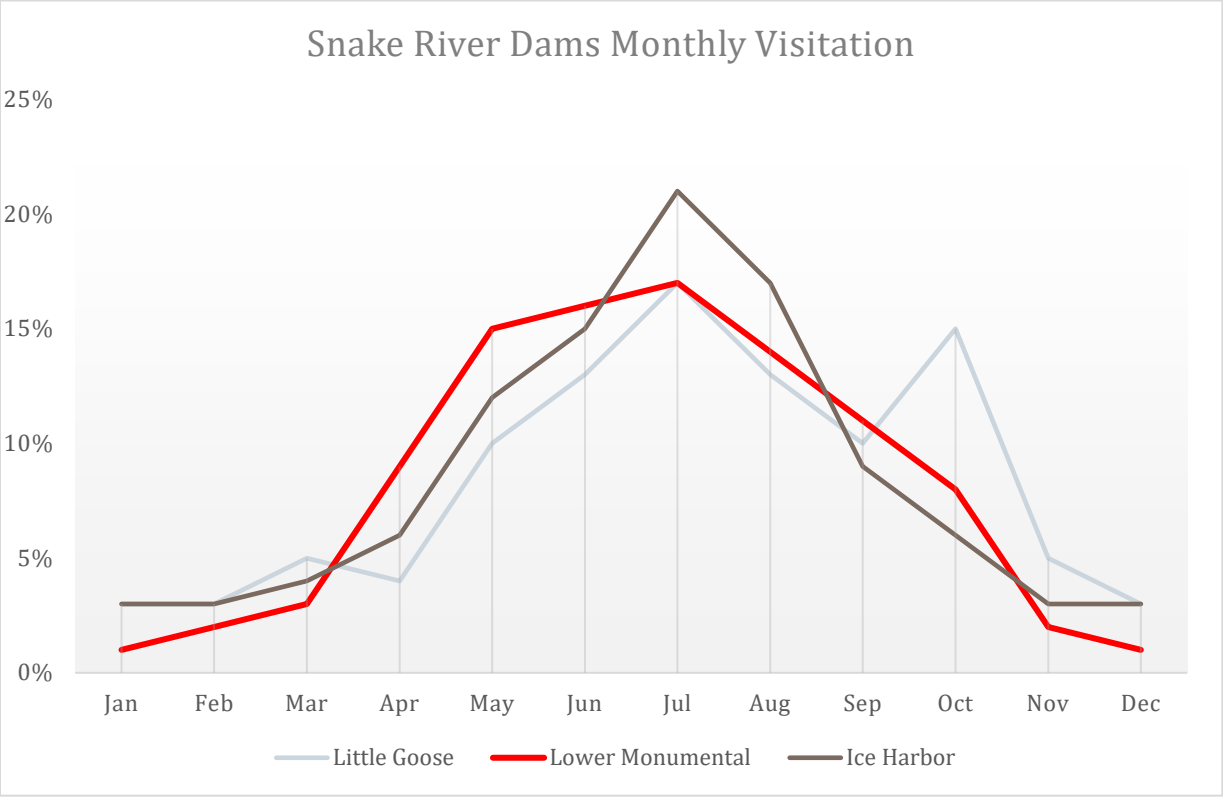

Figure 2-12. Snake River Dams Monthly Visitation by Percentage

Lyons Ferry State Park, Lyons Ferry Marina, and Lyons Ferry wildlife area account for 76 percent of visitation to the Project. Other sites are fairly evenly split around 4 to 8 percent of total visitation, largely due to use of boat launch locations for fishing activities.

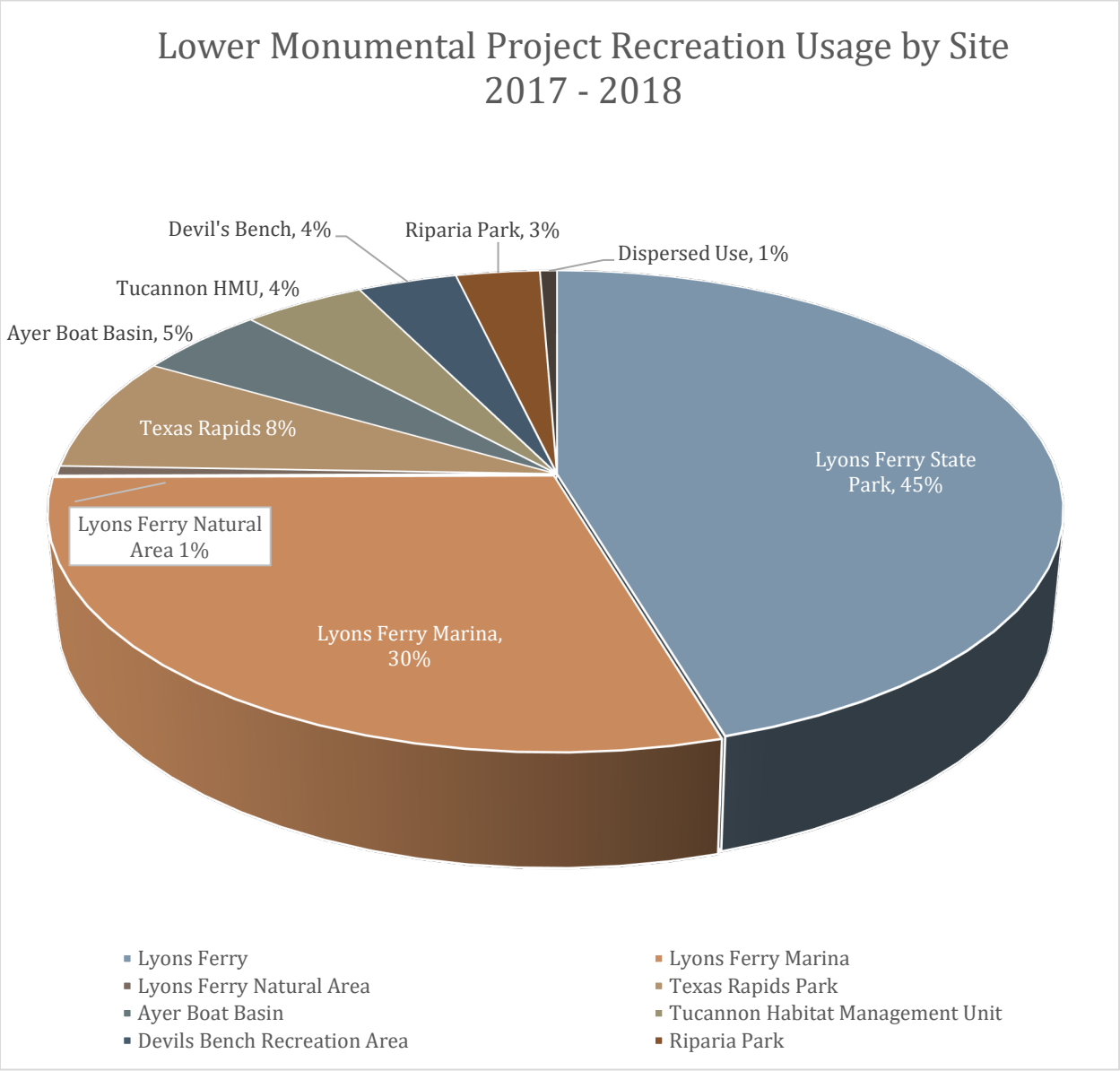

Figure 2-13. Lower Monumental Project Recreation Usage by Site 2017 – 2018

Table 2-2. Lower Monumental Project Visitation and Percentage by Location (Source: CRSO 2017-2018 average [Appendix M, Table 3-2])

LOCATION	VISITATION	PERCENTAGE
Ayer Boat Basin	8,405	5%
Devils Bench	6,418	4%
Dispersed Use	1,100	1%
Lyons Ferry Marina	51,677	30%
Lyons Ferry Natural Area	1,135	1%
Lyons Ferry State Park	79,350	45%
Riparia Park	5,421	3%
Texas Rapids Park	13,535	8%
Tucannon HMU	7,906	5%
Total	**174,947**	**100.00%**

2.8.4. Recreation Analysis

Washington State Comprehensive Outdoor Recreation Plan

The Statewide Comprehensive Outdoor Recreation Plan (SCORP) for Washington, Oregon, and Idaho were reviewed to establish the assumption that demand for recreation exist that will produce the projected benefits. Each state SCORP identifies increasing population and increasing demand for outdoor recreation, while addressing the changing demographics of an aging population. The relevant Washington SCORP reports are summarized below (Washington State Recreation and Conservation Office 2018).

- Washington State population is projected to grow by 2 million people (26%) by 2040, mostly from people moving into the state.
- More than 90% of Washingtonians recreate outside today.
- Top 10 outdoor recreation activities in Washington include walking in a park or trail setting (84%), visiting rivers or streams (66%), visiting a beach or tide pools (60%), attending an outdoor concert or event (58%), gathering or collecting things in a nature setting (54%), day-hiking (53%), sightseeing at a scenic or wilderness area (51%), wildlife or nature viewing (50%), swimming/wading at a freshwater beach (50%), and driving or motorcycling for pleasure (46%).

- 20% of residents reported using federal facilities for outdoor recreation.
- 74% of residents are satisfied or highly satisfied on average with all outdoor recreation categories.

Social Welfare Effects of Recreation

Lower Monumental Lock and Dam, including Lake Herbert G. West, provide a social welfare effect of $2,140,619 per year, and expenditures are estimated to be $8,266,827 annually.

Social welfare effects are evaluated by estimating the economic value (i.e., consumer surplus) resulting from average annual recreational visitation at near-river sites across the basin (water- and land-based use at reservoirs and river reaches). Social welfare effects are evaluated by estimating the change in economic value resulting from estimated changes in water-based visitation at reservoirs.

Social welfare effects are estimated using a unit day value (UDV) approach (Corps 2019a; Water Resources Council 1983), a standard Corps approach to evaluate recreation consumer surplus benefits. The UDV method relies on expert and informed opinion to assign relative values to recreational visits based on the quality of recreational opportunities supported by individual recreation areas. The social welfare analysis is done in two steps. First, recreational visits are converted to recreational visitor days to account for the fact that overnight trips are longer than 1 day. Second, UDVs are applied to the estimated recreational visitor days. Table 2-3 provides UDVs for area reservoirs in comparison to Lower Monumental Project.

Table 2-3. Unit Day Values for Columbia and Snake River Basin Reservoirs and River Reaches

Reservoir/River Reach	Unit Day Value (2019$)
Kootenai River between the US-Canada border and Libby Dam and Lake Koocanusa	$9.87
Flathead River above Flathead Lake and Hungry Horse Dam and Reservoir	$9.87
Clark Fork River, Flathead River below Flathead Lake, and Flathead Lake	$9.87
Pend Oreille River and Lake Pend Oreille	$8.97
Grand Coulee Dam and Lake Roosevelt	$9.05
Chief Joseph Dam and Lake Rufus Woods	$7.95
Wanapum Dam and Lake	$8.61
Clearwater River and Dworshak Dam and Reservoir	$9.87
Lower Granite Dam and Lake	$9.10
Little Goose Dam and Lake Bryan	$9.17
Lower Monumental Dam and Lake Herbert G. West	**$9.85**
Ice Harbor Dam and Lake Sacajawea	$8.66
McNary Dam and Lake Wallula	$8.61
John Day Dam and Lake Umatilla	$8.50
The Dalles Dam and Lake Celilo	$8.93
Bonneville Dam and Lake	$9.14
Below Bonneville Dam	$9.14

Recreation Benefits from Lower Monumental Lock and Dam and Lake West

Recreation benefits are measured in different ways to reflect the benefit gained to people recreating, to the people that support recreation, and job and income to the region.

Social Welfare effects are an estimate of the value a person receives above the price they pay for that activity. Expenditures are the estimated amount of money that people spend recreating. Regional benefit effects are an estimate of the change in jobs, the labor cost for those jobs, and the resulting value to the region from income and sales from jobs resulting supporting recreation.

Lower Monumental Lock and Dam and Lake West average annual recreation visitation from 2014 to 2018 is 115,269 visitors. This generates a social welfare benefit of $2.1 million per year. Expenditures from those visitors total $8.3 million per year, and approximately 98 percent of those expenditures are estimated to come from non-local visitors. The regional effects from recreation are estimated to be 63 jobs, labor income of $2 million, and total sales increase of $7.5 million.

2.8.5. Recreational Carrying Capacity

The Project provides a variety of water-related and land-based recreation opportunities (Table 2-4), and it is expected that the demand for recreation activities in the future will increase. Future recreation activities and increased usage without facility expansion will change the current user experience and could negatively impact the resources.

Table 2-4. Facilities Available Throughout Lower Monumental Project

8 recreation areas	6 trails
36 picnic sites	16 trail miles
101 camping sites	0 fishing docks
1 playground	6 boat ramps
1 swimming area	84 marina slips

Visitation data from 2014 to 2018 show a slight increase in visitation (Figure 2-14). This trend is expected to continue as population in the surrounding area increases.

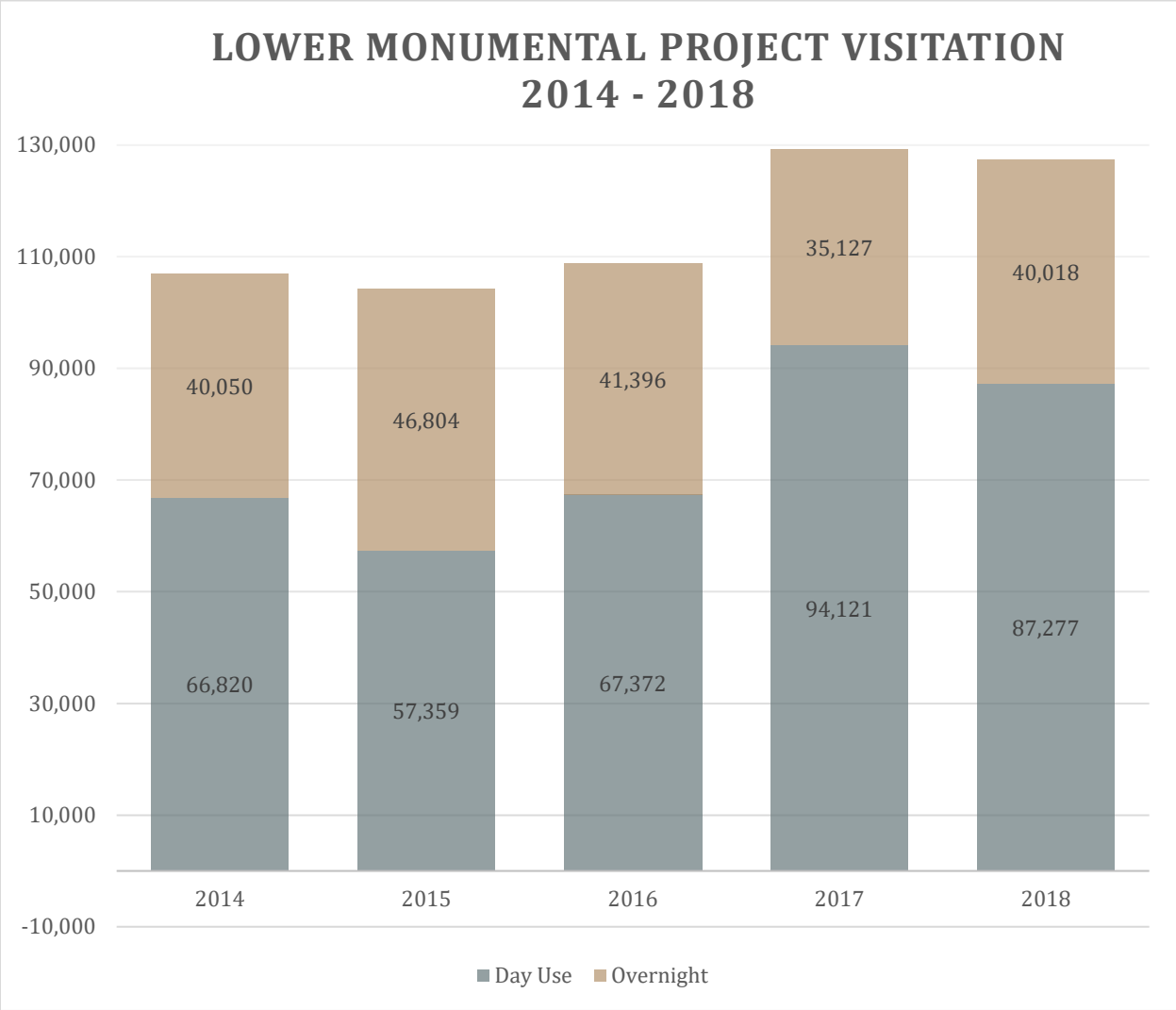

Figure 2-14. Lower Monumenal Project Visitation 2014 - 2018

Future Recreation Demand

Using the state population estimates and assuming recreation participation rate is constant with population growth, estimates for future recreation demand were computed for total Project visitation. The population estimate is a linear trend based on recent historical records. Any major societal changes could have dramatic effects that could skew the estimated population higher or lower. As the population estimate is extended beyond the current year the estimation range will grow.

The visitation assumes similar recreation patterns as currently demonstrated. An aging population and other demographic changes may greatly affect future visitation patterns. These estimates are for similar recreation demand and assumes facilities are available to

meet any increased recreation demand. As facilities reach their carrying capacity demand may shift to other recreation types, or to other sites outside this area.

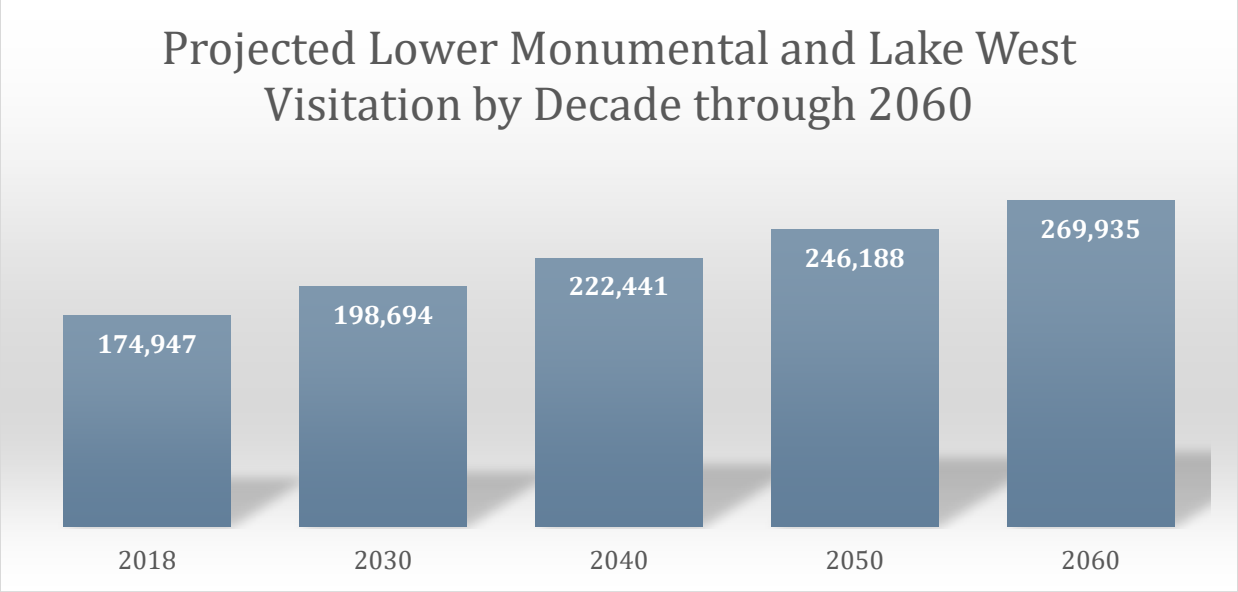

Figure 2-15. Projected Lower Monumental and Lake West Visitation by Decade through 2060

Recreation activities and sites around Lake West are varied. Recreation activities are relatively balanced among picnickers, swimmers, boaters, sightseers, and fishing. With the closing of Lyons Ferry State Park campground, developed camping is only available at Lyons Ferry Marina. However, Washington State Parks may soon update and reopen the camping area at Lyons Ferry State Park, which was specifically requested by commenters during public scoping for this Master Plan update.

Table 2-5 shows the distribution of recreation activities for visitors at Lower Monumental Project and other nearby projects. However, as previously stated, this data is not completely accurate due to the lack of trail and vehicle counters at most of the Project HMUs.

Table 2-5. Distribution of Recreation Use by Activity for Snake River Basin Reservoirs and River Reaches

Reservoir	Fishing	Camping	Boating	Swimming	Picnicking	Hunting	Sight-seeing	Other	Water-Based Visitation*
Clearwater River and Dworshak Dam and Reservoir	36%	13%	6%	5%	5%	1%	17%	17%	47%
Lower Granite Dam and Lake	13%	1%	7%	13%	9%	0%	11%	45%	33%
Little Goose Dam and Lake Bryan	14%	4%	17%	15%	15%	1%	13%	20%	46%
Lower Monumental Dam and Lake Herbert G. West	**19%**	**15%**	**14%**	**7%**	**10%**	**1%**	**8%**	**26%**	**40%**
Ice Harbor Dam and Lake Sacajawea	27%	2%	13%	11%	14%	0%	13%	21%	51%

*Water based visitation is the combination of fishing, boating, and swimming.

2.9. REAL ESTATE AND ACQUISITION POLICY

2.9.1. Land Acquisition History

Under PL 79-14, passed in 1945, Congress authorized the of dams on the Snake River for the primary purposes of navigation and irrigation, with authority for power development where determined appropriate. Since that time, subsequent legislation has authorized other project purposes, including recreation and fish and wildlife habitat. The Corps routinely analyzes lands for its needs in relation to the Project, and approximately 2,329 acres of land that had been designated as no longer needed for the Project has been disposed.

The U.S. Government currently owns 10,574 acres within the project boundary, which includes acreage that are submerged under Lake West due to the dam's construction and aer not included in the number of acres classified in this Master Plan (8.061 acres). Additionally, the U.S. Government has easements and reservation rights on 1,168 acres. Most of the project lands are centered along the shorelines of the Snake River, with some large parcels of land that stretch inland. The Corps has management rights and responsibilities on these U.S. Government owned lands. Of these lands, 816.01 acres were purchased and transferred to the project under the LSRFWCP as mitigation for lost habitat and hunter opportunity from construction of lower Snake River dams.

2.9.2. Outgrants

The purpose of an outgrant is to allow other agencies or individuals use of project lands. These outgrants are issued by easement, permit, license, or lease. Additionally, outgrants may be reserved in the Corps' acquisition of the property, and is codified in the conveyance document. Outgrants are issued if the land is available, there are no other viable alternative to the use of federal land and if the proposed use is consistent with operational needs and resource management objectives. Other outgrants may be issued and existing ones terminated or amended, as circumstances warrant. There are currently 77 outgrants on Project lands. The Real Estate Division of the Corps, Walla Walla District maintains all current information on outgrants and reservations.

2.10. PERTINENT PUBLIC LAWS, REGULATIONS, AND POLICIES

Rules and regulations governing the public use of water resources development projects administered by the Corps are contained in 36 CFR § 327. Other authorities specifically related to the management of recreation and public access are found in PLs; EOs; and the Corps Engineer Regulations, Engineer Manuals, and Engineer Pamphlets. They include, but are not necessarily limited to, those listed in Appendix A. A list of applicable Federal statutes is included in Appendix B.

The treaties between the United States and the Nez Perce Tribe, the CTUIR, and Yakama document agreements reached between the Federal Government and the Tribe. In exchange for the Tribes ceding much of their ancestral land, the Government established reservation lands and treaty rights, including fishing and hunting rights. These treaties, as well as statutes, regulations, and national policy statements originating from the executive branch of the Federal Government provide direction to Federal agencies on how to formulate relations with Native American Tribes and people. Treaties with the Nez Perce (Treaty of June 11, 1855, Treaty with the Nez Perces, 12 Stat. 957 (1859); Treaty of June 9, 1863, Treaty with the Nez Perces, 14 Stats. 647 (1867)), the CTUIR (Treaty of June 9, 1855 with the Walla Walla, Cayuse, etc, 12 Stat. 945 (1859)), and the Yakama (Treaty of June 9, 1855, Treaty with the Yakama, 12 Stat. 951) explicitly reserved unto the Tribes certain rights, including the exclusive right to take fish in streams running through or bordering reservations, the right to take fish at all usual and accustomed places in common with citizens of the territory, and the right of erecting temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed lands. These reserved rights include the right to fish within identified geographical areas.

2.11. ENVIRONMENTAL CONSIDERATIONS

The Master Plan is intended to deal in concepts, not in details of design or administration. Detailed management and administration functions are addressed in the OMP, which implements the concepts of the Master Plan into operational actions. Implementation of individual actions from the OMP may require separate environmental compliance evaluations. The EA conducted as part of the development of the 2020 Master Plan is included in Appendix B, which will likewise focus on potential impacts associated with changes to Project land use classifications.

3. Resource Objectives

Resource use goals provide the overall framework that guides the use of resources administered by the Corps at a project site. The goals and objectives in the Lower Monumental Master Plan are specific to Lower Monumental Project and its individual areas and specify attainable options for resource development and management. These goals have been developed through study and analysis of regional and local needs, public input, resource capabilities, and resource potential, and they are formulated to guide and direct the overall resource management program.

3.1. RESOURCE GOALS

The resource goals are included within four categories, as indicated below:

Project Operations

- Continue to safely, effectively, and efficiently provide benefits to the public consistent with the authorized Project purposes.

Natural and Cultural Resources Management

- Allow public access and use of Corps-owned land, as appropriate.
- Protect and preserve archeological and historical sites.
- Protect and enhance fish and wildlife habitat.
- Promote biological diversity and ecological system function.
- Control noxious weeds and other undesireable weed species.

Recreation and Interpretation

- Provide high quality, safe recreational facilities year-round to a wide segment of the public, including individuals with disabilities.
- Minimize conflicts between user groups and Corps operational requirements.

Coordination

- Maintain communication and coordination with appropriate Indian Tribes; Federal, State, and local agencies; and citizen groups and organizations for management of the manmade and natural resources at the Project.

3.2. RESOURCE OBJECTIVES

Resource Objectives are clearly written statements that respond to identified issues and specify measurable and attainable activities for resource development and/or management of the lands and waters under jurisdiction of the Walla Walla District at Lower Monumental Project. The objectives stated in this Master Plan support the goals of the Master Plan and the following Environmental Operating Principles:

- Foster sustainability as a way of life throughout the organization.
- Proactively consider environmental consequences of all Corps activities and act accordingly.
- Create mutually supporting economic and environmentally sustainable solutions.
- Continue to meet our corporate responsibility and accountability under the law for activities undertaken by the Corps, which may impact human and natural environments.
- Consider the environment in employing a risk management and systems approach throughout the life cycles of projects and programs.
- Leverage scientific, economic and social knowledge to understand the environmental context and effects of Corps actions in a collaborative manner.
- Employ an open, transparent process that respects views of individuals and groups interested in Corps activities.

The objectives are consistent with authorized Project purposes, Federal laws and directives, and they take into consideration regional needs, resource capabilities, the Washington SCORP, cultural and natural resources significant to regional Tribes, and public input. Recreational and natural resources carrying capacities are also accounted for during development of the objectives found in this Master Plan.

To address specific management needs, the Resource Objectives discussed in this chapter are divided into three categories—General, Recreation, and Environmental Stewardship.

3.3. GENERAL RESOURCE OBJECTIVES

3.3.1. Safety and Security

Objective: Provide use areas and facilities that are safe and provide the public with safe and healthful recreational opportunities.

Discussion: Developed areas designated for recreation use will be evaluated regularly for safety. Any conditions that have been determined unsafe will be evaluated, and feasible corrective actions will be implemented in accordance with Engineer Manual 385-1-1, Safety and Health Requirements.

3.3.2. Aesthetic Resources

Objective: Plan all management actions with consideration given to landscape quality and aesthetics.

Discussion: Corps regulations and guidance requires that the Corps considers and provides an aesthetically pleasing environment for the public. Visitors are attracted to the vistas, rolling topography, and water bodies that create high visual quality at the Project. In order to create a quality recreation experience, it is important that planned improvements be designed and maintained so that visual resources associated with the Project will be protected, preserved, and maintained to the maximum extent possible.

3.3.3. Facility Management

Objective: Ensure all current and future facilities are maintained and meet applicable design standards.

Discussion: All new or remodeled facilities will meet current standards. Upgrade and replacement of existing facilities will comply with Corps policy.

3.3.4. Real Estate Management

Objective: Prevent unintentional trespass and negative impacts associated with encroachments on Government property while allowing State, County, municipal, and private entities opportunities to provide public recreation services.

Discussion: Periodic boundary inspections will be conducted and encroachments and trespasses resolved at the lowest level possible. Unmarked monument boundaries and fence monument boundaries will be surveyed where feasible. Real estate proposals and requests will be compatible with Project purposes and minimize impacts to environmental and cultural resources. Lease agreements will comply with lease terms and conditions,

including Corps policies, federal and state laws, health and safety codes, and environmental protections.

3.4. RECREATION RESOURCE OBJECTIVES

3.4.1. Land and Water Universal Access

Objective: Provide use areas and facilities that are accessible for all Project visitors.

Discussion: Developed areas designated for recreation use will be evaluated regularly for accessibility. When developing new or rehabilitating existing recreation facilities/opportunities, effort should be made to comply with reasonable Americans with Disabilities Act (PL 101-336) accommodations. In addition, special emphasis should be placed on programs that increase participation in outdoor activities for people with physical, developmental, and sensory disabilities.

3.4.2. Interpretive Services and Outreach Program

Objective: Interpretive service will focus on agency, District, and Project missions, benefits, and opportunities. Interpretive services at the Project will be used to enhance public education and safety through promoting public awareness, understanding, and appreciation of the Project and its resources.

Discussion: The Lower Monumental Interpretive Services and Outreach Program includes the management of public affairs, community relations, marketing, publications, tourism, and special events. The Project will provide community outreach by participating in fairs and public events; providing interpretive displays and programs, day-use areas, community organizations, and the Chamber of Commerce; and releasing information to the press. Interpretive displays and programs should highlight several of the following subjects:

- The Corps.
- Land use classifications.
- History.
- Natural history.
- Project authorized purposes and public benefits.
- Impacts of the Project (historical, cultural, ecological).
- Historical and traditional uses of the area by regional Tribes.

- Recreation opportunities.
- Wildlife and fish associated with Project lands and waters, and opportunities to passively and actively use these resources.
- Water safety.
- Ongoing management activities.
- Challenges and possible solutions.

Opportunities exist to partner with local Tribes and other groups in the development of these displays and programs.

3.4.3. Recreation Optimization and Sustainability

Objective: Use leveraged resources when possible to maintain and improve recreation facilities that reduce operations and maintenance costs while meeting public demand.

Discussion: Project staff will promote community involvement through stakeholder meetings. Challenge cost share and cooperative agreements will be used to leverage additional resources, and a robust volunteer program will be developed and maintained to accomplish additional work.

3.4.4. Quality Outdoor Recreation in Rural Settings (Low Density Use)

Objective: Operate and maintain multipurpose facilities, as well as develop new facilities, that meet public demand and provide opportunities for multiple user groups in a rural setting.

Discussion: Continue efforts to provide dispersed recreation allowing visitors to participate in activities such as boating, primitive camping, fishing, hunting, horseback riding, hiking, nature study, bird watching, and wildlife photography. Managing user expectations and developing creative solutions in low density recreation areas will remain important as visitor use continues to increase. To enhance the quality of recreation opportunities, Project staff will continue to enforce 14-day camping limits (within a 30-day period) to prevent habitation per 36 CFR § 327.

3.5. ENVIRONMENTAL STEWARDSHIP RESOURCE OBJECTIVES

3.5.1. Riparian and Wetland Protection

Objective: Protect and limit impacts to wetlands and riparian corridors on the Project in conjunction with Project missions, water quality, and fish and wildlife benefits.

Discussion: Wetlands and riparian habitat are of high ecological importance within the watershed. The Corps ENS mission and the LSRFWCP have always focused a lot of effort on habitat development and maintenance of riparian species and habitat types. This can be seen in areas on Lake West such as 55 Mile, John Henley, and Skookum HMUs. Additionally, riparian and wetland areas are often the subject of targeted nuisance species control under the District's Integrated Pest Management Plan (IPMP), to maintain and enhance these habitats. No unnecessary removal or alteration of the systems will be promoted.

3.5.2. Fish and Wildlife Habitat Management

Objective: Conserve, protect, restore, and enhance habitat and habitat components important to the survival and proliferation of threatened, endangered, special status, regionally important, and LSRFWCP habitat and species on Project lands.

Discussion: Over the life of the Project, improvements have been made to enhance fish and wildlife habitat. Maintenance of existing and future habitats is critical to sustain a healthy ecosystem now and in the future. This includes extensive effort for invasive and nuisance species management along with other habitat enhancement the Corps has performed, to improve and increase wildlife sustainability for all forms of recreation. Emphasis will be placed on integration and use of native plant species whenever possible.

3.5.3. Cultural Resources Management

Objective: Inventory, record, and evaluate cultural resources per legal requirements of NHPA. Preserve resources as per the Archaeological Resources Protection Act of 1979 (PL 96-95), Native American Graves Protection and Repatriation Act (PL 101-601), and Treaty responsibilities. Pursue enforcement actions under Title 36, or through local law enforcement, in the event of destruction, injury, defacement, removal or any alteration of public property, including historical and archaeological features (36 CFR § 327.14).

Discussion: Planning and development will include considerations to protect and preserve culturally sensitive sites. Archaeological collections and records will be preserved for future generations, and managed for study by qualified researchers. Cultural resource review will be coordinated with District specialists, who will follow laws and guidelines for cultural

review according to Federal law and consult with SHPO and Tribal Historic Preservation Offices/Tribes as required. Convey importance of cultural resources and proactive planning to Project staff through planning documents and the Historic Properties Management Plan (Hicks 2000), and update those documents as appropriate.

3.5.4. Integrated Pest Management

Objective: Minimize negative impacts to native flora and fauna and damage to Government facilities by reducing and/or eradicating invasive and nuisance species on Project lands.

Discussion: Reducing and restricting the spread of invasive and nuisance species will be achieved by monitoring, assessment, and an integrated pest management approach to treatment according to the District's IPMP. This includes the use of chemical, mechanical, and biological control methods, as well as reseeding and planting with native plant species.

3.5.5. Fire Management

Objective: Minimize the negative effects of wildfires, including impacts to Federal property and the recreating public.

Discussion: Minimize the threat of wildland fire by enforcing the fire ban, reducing fuel load through mowing, and establishing native grasslands to offset the change in fire cycle due to invasive plant species. Lyons Ferry HMU is an example of this change; the cheatgrass infestation has reduced the natural fire cycle from an 8 to 15-year cycle to a 3 to 8-year cycle. Native plant communities, which are less conducive to burning, are diminished by more frequent fires. Efforts will be made to restore lands damaged by wildland fire back to native grasslands. Project personnel will be working on a prescribed burning plan that can be used as a tool to enhance wildlife habitat using methods such as prescribed burning and mowing.

4. Land Allocation, Land Classification, and Project Easement Lands

This chapter identifies and describes the land allocation categories and the land classifications at the Project under this 2020 Master Plan, including the number of acres and the primary and secondary uses for each classification. It also contains a summary of changes to land classifications since the 1966 Lower Monumental Master Plan.

4.1. LAND ALLOCATION

Land allocation refers to categorizing lands according to the congressionally-authorized purposes for which Project lands were acquired. Chapter 3 of EP 1130-2-550 defines these categories as Operations, Recreation, Fish and Wildlife, and Mitigation, as described below:

- Project Operations – These are lands acquired for the congressionally authorized purpose of constructing and operating the Federal Project for the purposes of hydropower, navigation, and incidental irrigation.
- Recreation – These are lands acquired specifically for the purpose of recreation.
- Fish and Wildlife – These are lands acquired specifically for the purpose of managing or protecting fish and wildlife.
- Mitigation – These are lands acquired or designated specifically for the congressionally authorized purpose of offsetting losses associated with development of the Project.

Lands associated with Lower Monumental Lock and Dam were originally purchased under the Project Operations allocation. In subsequent years, property was also purchased and allocated under Mitigation and Fish/Wildlife.

4.2. LAND CLASSIFICATION

All lands acquired for the Project are further classified to provide for development and resource management consistent with authorized purposes and other Federal laws. Land classification designates the primary use for which Project lands are managed. The classification process considers public input, regional and Project specific resource requirements, and suitability. Land classifications established in EP 1130-2-550 include the following six categories:

- Project Operations.
- High Density Recreation.
- Mitigation.
- Environmentally Sensitive Areas.
- Multiple Resource Managed Lands.
- Water Surface.

Chapter 4.2.1 provides a brief overview of the land classification changes that have occurred from 1966 to 2019 under the old land classification nomenclature. Chapter 4.2.2 shows how the Project land is classified under the 2020 Master Plan using the new land classification nomenclature. It also discusses the management and use of the lands assigned to each land classification, in connection with the appropriate resource objectives identified in Chapter 3.

4.2.1. Land Classification Changes from 1966 to 2019

Lower Monumental Lock and Dam lands have undergone several changes since the original Master Plan was developed in 1966. Table 4-1 identifies the total acres for each classification that has changed between 1966 and 2019, under the old land classification nomenclature. Figure 4-2 is a visual representation of the information provided in Table 4-1. The large-scale changes in land ownership and use over 50 years throughout the Project, along with the nomenclature changes, should have been documented in a Master Plan revision or supplement before now. However, funding for Master Plan updates is difficult to obtain, especially under the District's unique joint funding arrangement that requires BPA matching funds for appropriated dollars.

There were some large land disposals to the Great Northwestern Railroad for railroad relocation, and to the Ports of Whitman County and Kahlotus between 1966 and 2019, and myriad smaller disposals, resulting in a net decrease in total Project acres. Land was also

acquired during this time, mostly to meet mitigation requirements under the LSRFWCP. These changes were never included in a master plan update or supplement.

In 1969, a supplement to the 1966 Master Plan was approved. The supplement was completed to document the planned acquisition of 397 acres of land adjacent to what would become Lyons Ferry State Park, in order to "permit development of access roads and trails, and to afford proper control and preservation of the scenic, geologic, and other natural resources of the area," (Corps 1969). The state was beginning to plan for the development of State Route 261, and the Corps wanted to protect this scenic and culturally sensitive area from commercial development and to leave the "rugged natural beauty of the Palouse River Canyon" unspoiled.

Figure 4-1. Scenic Beauty of Palouse River Canyon

In June 1979, Recreation and Resource Management appendixes A through E to the 1966 Master Plan (Corps 1979) were approved and distributed. These appendixes updated the operations and intent for project lands, added a fish and wildlife plan to begin to address the requirements of the LSRFWCP, and detailed vegetation management plans for project lands. The updated Project Resources Management Plan discusses the lack of expected public visitation and the reduction of planned development after several years of operations.

The 1969 supplement was the only approved supplement to the 1966 Master Plan. Land acquisitions, disposals, and reclassifications through the years of operation that were never documented in an approved Master Plan or supplement are detailed in Appendix E. The 2020 Master Plan is an opportunity to document these changes and to ensure that the public record accurately reflects the management of lands in the Project.

Table 4-1. Land Classification Changes from 1966 to 2019

LAND CLASSIFICATION NOMENCLATURE	1966 ACRES	2019 ACRES
Not Classified	4048.7	3166.8
Project Operations	360.6	360.6
Public Port Terminal	114.4	98.6
Industrial Use and Access	1192.2	1092.5
General Access	232.4	232.4
Initial Development	1227.7	1224.6
Wildlife	658.6	1912.6
To be Transferred	1238.9	0.0
TOTAL ACRES	**9073.6**	**8088.2**

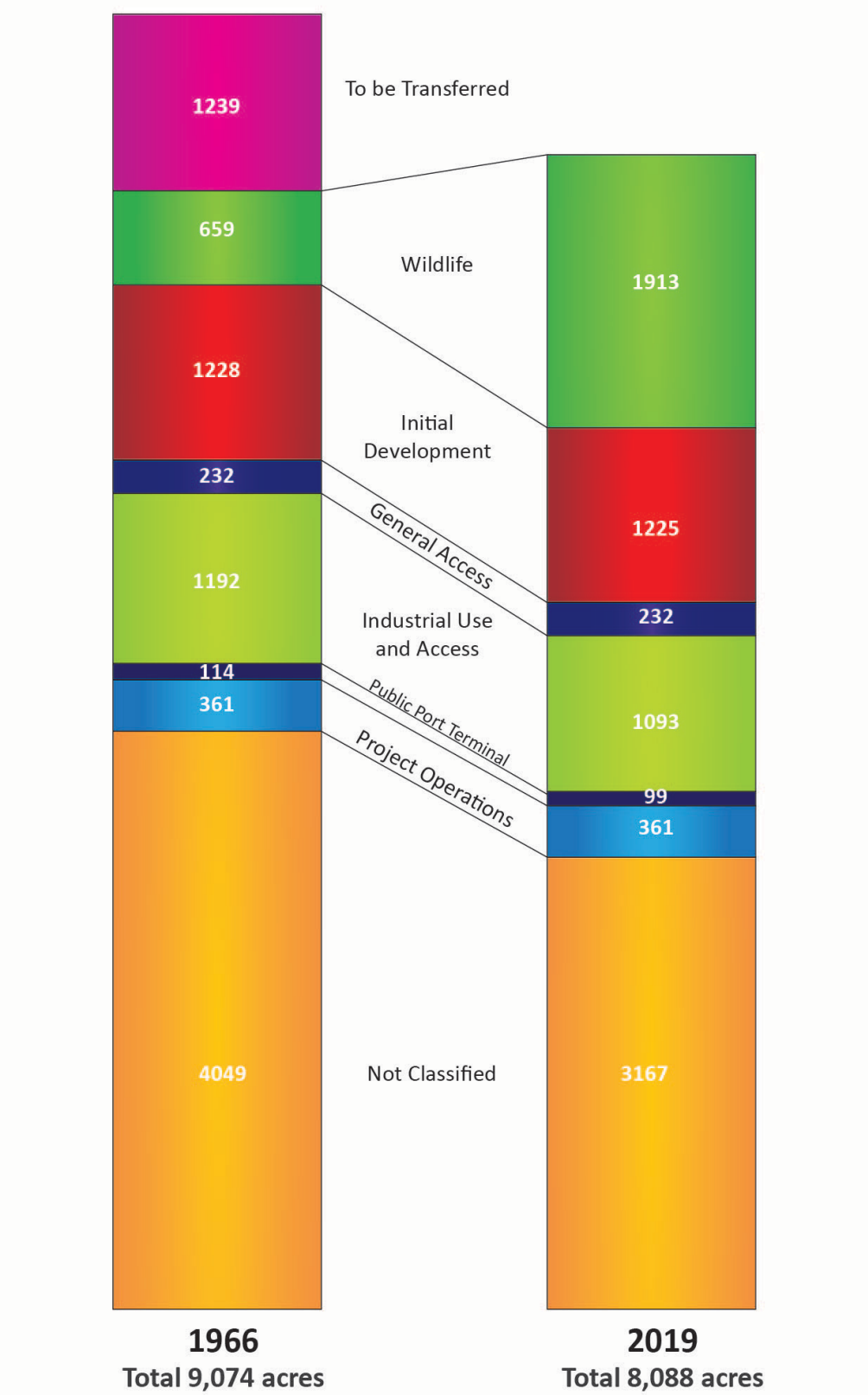

Figure 4-2. Changes in Acreage per Land Classification from 1966 to 2019

4.2.2. Proposed Land Classifications for the 2020 Master Plan

An interdisciplinary team evaluated the Project operations, resource capabilities, as well as public input to determine the land classifications for Lower Monumental Project. In order to revise the MP, the team needed to translate the old land classifications to the currently authorized land classifications under EP 1130-2-550. Table 4-2 below is a rough translation between the two different classification nomenclatures.

Table 4-2: Old Land Classification Nomenclature and New Land Classification Nomenclature

OLD LAND CLASSIFICATIONS	NEW LAND CLASSIFICATIONS
Project Operations Public Port Terminal Industrial Use and Access	Project Operations
Recreation General Access Initial Development Group Camping	High Density Recreation
----- ----- Future Development Wildlife Special	Multiple Resource Management Low Density Recreation Future and Inactive Recreation Areas Wildlife Management Vegetative Management
To be Transferred	-----
Not Classified	-----
-----	Mitigation

Using the information in Table 4-2 and current management strategies for each land management unit, the team classified lands for the 2020 Master Plan using the currently authorized land classification nomenclature.

This chapter identifies how lands are classified under the 2020 Master Plan under the new land classification nomenclature, and provides an explanation for each of the land classifications, including the applicable primary and secondary uses. Table 4-3 identifies each of the land classifications and the number of acres at the Project. Appendix C contains the maps for these classifications. Tables E-1 and E-2 (Appendix E) identify the specific land classification changes by management area between 2019 and the 2020 Master Plan.

Table 4-3. Proposed Land Classifications for the 2020 Master Plan

LAND CLASSIFICATION	ACRES
Project Operations	760.0
High Density Recreation	320.0
Mitigation	3643.0
Environmentally Sensitive Areas	792.4
MRM–Low Density Recreation	19.6
MRM–Wildlife Management	2489.0
MRM–Future or Inactive Recreation Area	37.2
TOTAL ACRES	**8061.2**

4.2.3. Project Operations

Lands required for the operation and maintenance of the dam and reservoir, associated structures, administrative offices, maintenance compounds, and other areas are classified as Project Operations. Where compatible with the operational requirements, this land may be used for wildlife habitat management and low density recreational uses. Licenses, permits, easements, or other outgrants are issued only for uses that do not conflict with operational requirements. Some Project Operations lands are closed to public access for safety or security reasons, while other areas may be subject to closure for operational requirements or other purposes. Table 4-4 contains a listing of primary and secondary uses on lands classified under Project Operations.

Table 4-4. Project Operations, 760.0 Acres

Primary Use	**Secondary Uses***
Manage land required for the operation and maintenance of the dam and reservoir.	Wildlife Management -Ecological restoration projects -Other similar activities Low Density Recreation -Hunting/Fishing -Hiking -Picnicking -Sightseeing and nature observation -Other recreation activities of a primitive nature

*Project lands have information signs for visitors if there are any deviations from primary or secondary uses of the lands.

4.2.4. High Density Recreation

Lands developed for intensive recreational activities by the visiting public are included in the High Density Recreation land classification. Low density recreation and wildlife management activities that are compatible with intensive recreation use are acceptable. No agricultural uses are permitted on these lands except on an interim basis for the maintenance of scenic or open space values. Licenses, permits, easements, or other outgrants are issued only for uses that do not conflict with recreation use. Hunting is not allowed on land classified as High Density Recreation, although fishing is an appropriate non-conflict recreational activity. Table 4-5 contains a listing of primary and secondary uses on lands classified under High Density Recreation.

Table 4-5. High Density Recreation, 320.0 Acres

Primary Uses	**Secondary Uses***
Manage land for developed recreation sites. -Picnicking -Swimming -Fishing -Sightseeing and nature observation -Nature/Interpretive trails -Hiking -Bicycling -Horseback riding -Playgrounds/Games/Sports/Other -Boat ramps	Wildlife Management -Ecological restoration projects Low Density Recreation -Non-motorized trails -Other recreation activities of a primitive nature

*Project lands have information signs for visitors if there are any deviations from primary or secondary uses of the lands.

4.2.5. Mitigation

Only land identified, purchased, and/or allocated under the Mitigation land allocation can be included under the Mitigation land classification. It is specifically designated to offset losses associated with the development of a project. At the Project, Mitigation lands are associated with wildlife habitat purchased and developed under the LSRFWCP. Development of recreation facilities in Mitigation areas may be limited or prohibited to ensure that the lands are not adversely impacted. Table 4-6 contains a listing of primary and secondary uses on lands classified under Mitigation.

Table 4-6. Mitigation, 3,643.0 Acres

Primary Use	**Secondary Uses***
Manage habitat under the LSRFWCP.	Wildlife Management -Ecological restoration projects -Other similar activities Low Density Recreation -Non-motorized trails -Hunting/Fishing -Hiking -Picnicking -Sightseeing and nature observation -Other recreation activities of a primitive nature

*Project lands have information signs for visitors if there are any deviations from primary or secondary uses of the lands.

4.2.6. Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are areas identified with scientific, ecological, cultural, or aesthetic features, or that are otherwise protected by laws; this classification is not limited to just land. Typically, limited or no development for public use is allowed. Activities designed to promote and improve special features identified in the area are allowed, along with education and interpretation. Development of recreation facilities in ESAs may be limited or prohibited to ensure that the lands are not adversely impacted. Table 4-7 contains a listing of primary and secondary uses on lands classified under ESA.

Table 4-7. Environmentally Sensitive Areas, 792.4 Acres

Primary Use	**Secondary Uses***
Manage land to protect unique and sensitive resources. -Scientific -Cultural -Ecological -Aesthetic	Wildlife Management -Ecological restoration projects -Other similar activities Low Density Recreation -Nature observation -Education/Interpretation

*Project lands have information signs for visitors if there are any deviations from primary or secondary uses of the lands.

4.2.7. Multiple Resource Management Lands

The Multiple Resource Management (MRM) Lands classification allows for designation of a predominant use with the understanding that other compatible uses may also occur in the classification. Total acreage under MRM Lands classification for the Project is

approximately 2,545.8 acres and is divided into subclassifications of Low Density Recreation, Wildlife Management, and Future or Inactive Recreation Areas.

MRM–Low Density Recreation

Land in the MRM–Low Density Recreation (LDR) subclassification provides opportunities for dispersed and/or low-impact recreation. Emphasis is on minimal development of infrastructure that might support sightseeing, wildlife viewing, nature study, hiking, biking, horseback riding, and picnicking. Consumptive uses of wildlife (i.e., hunting, fishing) are allowed when compatible with the wildlife objectives for a given area and with Federal, State, and Tribal fish and wildlife laws and regulations.

Facilities may include boat ramps, boat docks, trails, parking areas, vault toilets, picnic tables, and fire rings. Manmade intrusions (power lines, non-Project roads, and water and sewer pipelines) may be permitted under conditions that minimize adverse effects on the natural environment. Vegetation management that does not greatly alter the natural character of the environment is permitted for a variety of purposes, including erosion control, retention and improvement of scenic qualities, and wildlife management. Table 4-8 below contains a listing of primary and secondary uses on lands classified under MRM–LDR.

Table 4-8. MRM - Low Density Recreation, 144.8 Acres

Primary Uses	**Secondary Uses***
Manage land for low density, low impact recreation opportunities. -Hunting/Fishing -Hiking -Bicycling -Horseback riding -Campgrounds <15 sites -Primitive camping (designated sites) -Picnicking -Swimming -Sightseeing and nature observation -Motorized access trails and roads -Boat ramps -Non-motorized trails -Other recreation activities of a primitive nature	Wildlife Management -Ecological restoration projects -Other similar activities

*Project lands have information signs for visitors if there are any deviations from primary or secondary uses of the lands.

MRM–Wildlife Management

Land in the MRM–Wildlife Management (WM) subclassification is designated for stewardship of fish and wildlife resources in conjunction with other land uses. Habitat maintenance and/or improvements are for a designated species, group of species, and/or a diversity of species. These areas may be administered by other public agencies under a lease, license, permit, or formal agreement. Licenses, permits, and easements are normally not allowed for manmade intrusions such as pumping plants, pipelines, cables, transmission lines, or for non-Corps maintenance or access roads. Exceptions to this policy are allowable where necessary to serve a demonstrated public need in those instances where no reasonable alternative is available, or other reasons deemed important by the Corps.

MRM-WM land is available for sightseeing, wildlife viewing, nature study, hiking, biking, horseback riding, and primitive camping. Consumptive uses of wildlife (hunting, fishing, and trapping) are allowed when compatible with the wildlife objectives for a given area, as well as with Federal, State, and Tribal fish and wildlife laws and regulations. Table 4-9 contains a listing of primary and secondary uses on lands classified under MRM–WM.

Table 4-9. MRM - Wildlife Management, 2,489.0 Acres

Primary Uses	**Secondary Uses***
Manage land for stewardship of fish and wildlife resources. -General forest health -Habitat enhancement projects -Ecological restoration projects -Protection of specific habitat areas / components (i.e., denning sites, calving sites, nests and wallows, etc.) -Other similar activities	Low Density Recreation -Hunting/Fishing -Hiking -Horseback riding -Campgrounds <15 sites -Primitive camping (designated sites) -Picnicking -Swimming -Sightseeing and nature observation -Motorized access trails and roads -Boat ramps -Non-motorized trails -Other recreation activities of a primitive nature

*Project lands have information signs for visitors if there are any deviations from primary or secondary uses of the lands.

MRM–Future or Inactive Recreation Areas

The Future or Inactive Recreation Areas (FIRA) subclassification consists of lands for which recreation areas are planned for the future or lands that contain existing recreation areas

that have been temporarily closed. Table 4-10 contains a listing of primary and secondary uses on lands classified under MRM–FIRA.

Table 4-10. MRM - Future or Inactive Recreation Areas, 37.2 Acres

Primary Uses	**Secondary Uses***
Manage land that will not limit the ability to develop or maintain an area as a recreation area.	Wildlife Management -General forest health -Ecological restoration projects -Other similar activities Low Density Recreation -Hunting/Fishing -Hiking -Bicycling -Horseback riding -Campgrounds <15 sites -Primitive camping (designated sites) -Picnicking -Swimming -Sightseeing and nature observation -Motorized access trails and roads -Non-motorized trails -Other recreation activities of a primitive nature

*Project lands have information signs for visitors if there are any deviations from primary or secondary uses of the lands.

4.2.8. Water Surface

The Project manages 6,571.2 acres of surface water. The water surface acreage at the Project is divided into the following zones to support public safety and security:

- Restricted – Water areas restricted for Project operations, safety, and security purposes.
- Designated No-Wake – To protect environmentally sensitive shoreline areas, recreational water access areas from disturbance, and/or public safety.
- Fish and Wildlife Sanctuary – Annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning.
- Open Recreation – Those waters available for year-round or seasonal water-based recreational use.

4.3. PROJECT EASEMENT LANDS

The Corps holds an easement interest, but not the fee title to these lands, and has the right to enter the property in connection with the operation of the Project. In most cases, the Corps has the right to occasionally flood these properties. Planned use and management is in strict accordance with the terms and conditions of the easement estate acquired for the project. The Corps of Engineers has acquired easements on approximately 1,668 acres of land adjacent to the Lower Monumental Project.

4.3.1. Operations Easement

Operations easements were purchased by the Corps for the purpose of project operations. The Corps acquired 118 acres for activities to include roads and communication line rights-of-way.

4.3.2. Flowage Easement

These are easements purchased by the Corps or reserved as part of Corps disposal of fee lands, giving the right to flood private land during flood risk management operations. There are 1,550 acres of flowage easement land located near the Project. These easements are most commonly found near the river shores.

4.4. LAND CLASSIFICATION SUMMARY

Table 4-11 summarizes the land classification changes from the 2019 acreage to the acreage for the 2020 Master Plan, converting the 2019 classifications to the new land classification nomenclature in EP 1130-2-550. Appendix C, Land Classification Maps, provides the new land classification maps for the 2020 Master Plan. A full list of land classification changes for each management area within the Project and the reasons for those changes is provided in Appendix E.

Table 4-11. Land Classification Changes from 2019 to 2020

LAND CLASSIFICATION NOMENCLATURE	2019 ACRES	2020 ACRES
Project Operations	1551.7	760.0
High Density Recreation	1457.0	320.0
Mitigation	---	3643.0
Environmentally Sensitive Areas	---	792.4
MRM-Low Density Recreation	---	19.6
MRM-Wildlife Management	1912.6	2489.0
MRM-Future or Inactive Recreation Area	---	37.2
Not Classified	3166.8	---
Total	**8088.2**	**8061.2**

5. Resource Plan

Building on Chapter 4, which provided more general land classification descriptions and acreage for each of the classifications at Lower Monumental Project, Chapter 5 provides information on how the management areas (e.g., parks, HMUs) within each of the land classifications will be managed. The management areas identified are presented in broad terms. A more descriptive plan for managing these lands will be refined in the Lower Monumental OMP. Management tasks described in the OMP must support the resource objectives, land classifications, and resource plan set forth in this Master Plan. Numbers of acres listed under land classification categories were summarized using the Corps geographic information system (GIS) database and may be off by several tenths of an acre at each site.

5.1. PROJECT OPERATIONS

Project Operations lands are managed to support the operation and maintenance of the dam and reservoir, associated structures, administrative offices, maintenance compounds, and other areas that are classified as Project Operations. There are a total of 760.0 acres designated under the Project Operations land classification. This is a reduction in acreage from 1,551.7 to 760.0 acres in the 2020 Master Plan. Management of the Project after construction of Lower Monumental Lock and Dam requires fewer lands in this category, so lands were moved to more appropriate classifications based on the resource needs of the areas. The management areas in this land classification are shown in Table 5-1.

A total of 1,158.3 acres moved out of the Project Operations land classification from 2019: 823.2 acres moved into Mitigation, 2.4 acres moved into MRM-LDR, and 23 acres moved into MRM-WM. A total of 106.9 acres moved into Project Operations from previously unclassified lands. Detailed tables showing land classification changes by management area are provided in Appendix E.

Table 5-1. Project Operations Lands

MANAGEMENT AREA	TOTAL ACRES
Joso Quarry	167.0
Lower Monumental Dam	134.9
Lower Monumental North Shore Storage Yard	16.4
Lower Monumental Road	66.7
Lower Monumental South	309.7
Lower Monumental State Airport	44.2
Lower Monumental Substation	18.2
Water Tank Road	3.0
TOTAL	**760.0**

Joso Quarry. Joso Quarry is a decommissioned quarry that was used for nearby construction projects. Evidence of past operations is still present, like large boulders and rock piles.

Lower Monumental North Shore Storage Yard. This area is used by the Project for storage of equipment, supplies and other materials for project operations.

Lower Monumental Road. This road provides vehicle access to Lower Monumental Dam from the south.

Lower Monumental South. This area surrounds Lower Monumental State Airport and Lower Monumental Substation, and connects to Lower Monumental Road. Due to the sensitive areas contained within Lower Monumental South, public acess should be limited and hunting cannot be allowed. This land has little value for wildlife habitat.

Lower Monumental State Airport. The airport is located on the south shore just below Lower Monumental Lock and Dam, and about five miles south of Kahlotus, Washington. It is leased to Washington State Department of Transportation (WSDOT). It is open year-round and used by the public for recreational aircraft and occasionally spray planes, though there may be snow on the runway during winter months. The 3,300-foot gravel runway is in good condition and has been compacted and oiled yearly since 2009. Vehicle access is allowed by permission only on a limited basis by contacting the state airport manager.

Figure 5-1. Lower Monumental State Airport. Source: WSDOT

Lower Monumental Substation. The substation channels the energy produced from the Lower Monumental Dam powerhouse to the power grid.

Water Tank Road. Water Tank Road provides access to the water tank off Ayer Road.

5.2. HIGH DENSITY RECREATION

There are 320 acres managed under the High Density Recreation land classification. Lyons Ferry State Park and Lyons Ferry Marina are classified as High Density Recreation and leased to other organizations for operation and management (Table 5-2). The Corps does not provide any maintenance within any of these leased locations, but there are times when the Corps provides support to the managing agency by reviewing requests for modifications to ensure they meet applicable laws and regulation for proposed activities. The goal is to work with Corps partners to ensure recreation areas are being managed in accordance with resource objectives identified in Chapter 3, Resource Objectives.

The acreage for the High Density Recreation land classification was reduced from 1,457 to 320 in the 2020 Master Plan. This is largely because the 1966 Master Plan planned for a much greater public use and demand for parks and high density recreation facilties than actually came to fruition. Additionally, it became apparent that operation and maintenance of lush irrigated grounds that the public desire was prohibitively expensive in this semi-arid environment, and that visitation did not justify the expense. Finally, silt became an issue in boat basins, and land was needed to meet LSRFWCP requirements. Parks were planned but only partially developed (e.g., Lyons Ferry, Ayer Boat Basin, Texas Rapids). The management areas in this land classification are shown in Table 5-2.

A total of 1,208.7 acres moved out of the High Density Recreation land classification from 2019: 424.4 acres moved into ESA, 341.3 acres moved into Mitigation, 37.7 acres moved into MRM-FIRA, 14.3 acres moved into MRM-LDR, and 325 acres moved into MRM-WM. A total of 31.3 acres moved into High Density Recreation from other land use classifications: 13.6 acres from MRM–WM, and 17.7 acres not previously classified. Detailed tables showing land classification changes by management area are provided in Appendix E.

Table 5-2. High Density Recreation Areas and Area Managing Agencies

MANAGEMENT AREA	TOTAL ACRES	MANAGEMENT AGENCY
Ayer Boat Basin	169.2	Corps
Devils Bench	25.7	Corps
Lyons Ferry Marina	29.2	Port of Columbia
Lyons Ferry State Park	83.4	Washington State Parks
Texas Rapids Park	12.5	Corps
TOTAL	**128.3**	

Ayer Boat Basin. Ayer Boat Basin is located on the south shore at RM 51. Access by vehicle along Ayer Road. Ayer Road has deteriorated, but we are looking at replacing it with compacted gravel for easier long-term maintenance. Boaters can access the boat basin from Lake West by passing through a tunnel under the railroad. The primary recreation activities are fishing and camping. The area features primitive camping, with most campsites containing a fire-ring and covered picnic table, with three more shelters planned for future installation. In addition, the area offers a single vault toilet, two-lane boat ramp, and ample parking. It is open year-round, with no specific hours of operation. The basin has been silted in, has become an aquatic weed problem area (especially milfoil), and is unusable to many motorized vessels. But with careful navigating, the ramp and basin can be used to access Lake West. This basin provides great bass and crappie fishing opportunities for anglers with shallow draft boats and for shoreline anglers.

Figure 5-2. Ayer Boat Basin

Devils Bench. Devils Bench is just upstream from the Lower Monumental Dam on the North Bank. Access by vehicle along Devils Canyon Road, south of Kahlotus. It offers four shade shelters due to the lack of trees at this site, primitive campsites, and a two-lane boat launch. Most campsites consist of a fire-ring and covered picnic table. In addition, the area offers a single vault toilet and ample parking. On the north side of the area is a large open space for group camping. It is open year-round, with no specific hours of operation. The primary recreation activities are camping and fishing. Driftwood tends to gather at the boat launch in the spring; this can be a nuisance for boaters, but members of the public with wood permits can gather it for firewood (contact the Tri-Rivers Natural Resources Management Office at 509-547-2048 for information on wood permits).

Figure 5-3. Shelters at Devils Bench

Lyons Ferry Marina. Lyons Ferry Marina is an outgranted recreation area that boasts a restaurant, boat ramp, campground, and a marina. There is also a small supplies store, dog park, playground, and waterborne group restroom facility with showers. The reservable campsites include full hook up sites, tent sites, and reservable cabins with waterborne restrooms. Near the town of Starbuck on the South Bank on State Highway 261, Lyons Ferry Marina is leased to the Port of Columbia. The State of Washington's Parks and Outdoor Recreation Department, the Port of Columbia County, and the Corps all contributed toward the construction costs of this area in the 1970s. The marina has 84 covered boat slips and is open year-round, with the heaviest use occurring May through October.

Figure 5-4. Lyons Ferry Marina

Lyons Ferry State Park. Lyons Ferry State Park on the North Bank offers visitors beautiful, grassy areas. The very popular day use recreation area features a swim beach, boat ramp, waterborne restrooms, vault restrooms, and picnic tables. The swimming beach is a big draw, and visitors can also use shade shelters and grills/fire pits. The surrounding water area is designated no-wake, so it is heavily used by people in canoes, kayaks, and stand-up paddleboards. The 60-site primitive camping area to the west of the day use area has been closed since 2011. The State is evaluating options to reopen the camping area. The historic Lyons Ferry is permanently moored just off the shoreline. Lyons Ferry Marina sits across the river. This area is popular with bird-watchers, and also is often used for shoreline fishing.

The Palouse Ferry began commercial operation on June 5, 1860. In 1926, the name of the ferry was changed to Lyons Ferry in honor of the family who had mostly operated it over the years. The ferry continued operation until 1965. This ferry was an important link on the

Old Mullan Road, built by John Mullan, to move military troops between Fort Benton on the Missouri River in Montana and Fort Walla Walla on the Columbia River.

The park opened to the public in 1971, and was operated by Washington State Parks until 2002, when operation was returned to the Corps. Between 2002 and 2011, it was operated by a private company, then from 2011 to 2015, the Corps operated the day use area of the park with volunteer labor. In 2015, operation of the park was transferred back to Washington State Parks.

Figure 5-5. Lyons Ferry State Park

Texas Rapids. Texas Rapids is located just two miles downstream from Little Goose Dam on the south shore. Many visitors camp here overnight so they can launch from the single-lane boat ramp and get an early start fishing. This area features primitive campsites, fire pits, picnic sites, information kiosk, vault restrooms and the boat ramp has solar lighting to cater to the public demand. The primary recreation activities are camping, fishing and picnicking. The area is popular with walleye and bass anglers as well as salmon anglers when there is an active season, and with campers.

Figure 5-6. Texas Rapids Full of Campers

5.3. MITIGATION

There are 3,643 acres of land designated for Mitigation within the Project area, with John Henley, Lyons Ferry East, Joso, and 55 Mile HMUs making up the largest parcels. This is an increase in acreage from 0 to 3,643 in the 2020 Master Plan; Mitigation was not an approved land use for the 1966 Master Plan, and we are updating the land classification system with this Master Plan. Additionally, the LSRFWCP was put into place after the 1966 Master Plan was written. The management areas in this land classification are shown in Table 5-3.

A total of 341.3 mitigation acres were previously classified as High Density Recreation, 1,276.1 acres as MRM-WM, 823.2 acres as Project Operations, and 1,202.5 acres were previously unclassified. Detailed tables showing land classification changes by management area are provided in Appendix E.

These lands were designated as Mitigation as part of the LSRFWCP, authorized in 1976 to mitigate for lost hunting and fishing opportunities as a result of the construction of the four lower Snake River dams. Wildlife management strategies were agreed upon with the Corps, USFWS, and the Washington Department of Fish and Wildlife (WDFW).

The Corps completes mitigation through the establishment of HMUs. Acquisition, establishment, and development of the HMUs has occurred since the early 1970s, with the bulk of the work being done in the 1980s and early 1990s.

The 1979 supplement recommended 54 management units for classification as wildlife lands with associated management across the Lower Snake River projects. There were three levels of development: intensive, moderate, or none. Ten units were originally

recommended for intensive development, 25 units for moderate development, and 19 units for no/limited development. Of those, in the Lower Monumental Project, three were classified as intensive, seven as moderate, and four as none/limited development.

The supplement described intensively developed sites as those that incorporated the habitat components of "trees and shrubs, meadows, pastures, fence associations, fields, annual food plots, water guzzler complexes, and nest structures." This development includes irrigation. These sites selected for intensive management were chosen for mitigation because they were large; had potential for farming both grasses and legumes; boasted a network of trees and shrubs; and had sufficient land immediately adjacent to a water source to pasture Canada geese. HMUs with moderate development included dryland development (planting annual crops, fertilization, and mowing), wildlife water guzzlers (guzzlers), nest platforms or boxes, and fencing. The HMUs categorized as no/limited development have remained largely undeveloped, with some sites adding guzzlers and reseeding with native species over time.

The LSRFWCP mitigation strategy was originally based on "substantial comprehensive development of project and non-project lands" and the "maintenance of habitat and production of game animals which will sustain the hunting pressure, appreciative use which would have occurred if the Project had not been constructed, and the maintenance of nongame animals at pre-project levels" (Corps 1975).

This strategy was implemented without specific and measurable objectives, so, in 1989, a letter of agreement between the Corps, USFWS, and Washington Department of Wildlife (WDW, which is now WDFW) modified the strategy to develop habitat-based compensation objectives. These objectives were established using an agreed-upon Habitat Evaluation Procedures (HEP) analysis for identifying pre-Project conditions, and for then measuring progress toward the habitat objectives. The HEP analysis used several "indicator" species' biological requirements and cover types as indicators of the habitat quality to obtain habitat units, which were then compared to the objectives to measure success.

Table 5-3. Mitigation Lands

MANAGEMENT AREA	ACRES	MANAGEMENT CLASSIFICATION
55 Mile HMU	305.9	Intensive Development
John Henley HMU	919.0	Intensive Development
Skookum HMU	229.4	Intensive Development
TOTAL INTENSIVE DEVELOPMENT	**1,454.3 ACRES**	
Ayer HMU	116.9	Moderate Development
Joso East HMU	43.2	Moderate Development
Joso HMU	330.5	Moderate Development
Lyons Ferry HMU	396.5	Moderate Development
Riparia HMU	160.3	Moderate Development
Sixty Mile HMU	221.0	Moderate Development
Tucannon HMU	279.4	Moderate Development
TOTAL MODERATE DEVELOPMENT	**1,547.8 ACRES**	
Magallon HMU	66.3	Limited Development
Sargent HMU	197.0	Limited Development
Texas Rapids HMU	136.9	Limited Development
Wild Rose HMU	240.8	Limited Development
TOTAL NO DEVELOPMENT	**640.9 ACRES**	

*"Limited development" is referred to as "no development" in various LSRFWCP documents. The term "limited development" more clearly describes habitat enhancement activities that occur in these sites, such as installation of wildlife guzzlers, reseeding with native species, dryland vegetation enhancement if necessary.

5.3.1. Mitigation – Intensive Development

55 Mile HMU. 55 Mile HMU is used for fishing, hiking, hunting, bird watching, and wildlife viewing. Approximately 100 acres is under irrigation, with planted vegetation consisting of mixed trees and shrubs, food plots, and pastures. Russian olive is being managed to increase avian diversity in corporation with a 5-year research study being conducted by the Engineer Research and Development Center (ERDC). The site supports a number of game species to include deer, pheasant and quail. 55 Mile HMU is only accessible by boat. The management goals for the future are to reduce Russian olive, control other invasive species, and replace food crops with native plants that will provide the same ecosystem service.

Figure 5-7. Big Gun Irrigation of Crops at 55-Mile HMU

John Henley HMU. This HMU features 3 wildlife food plots, totaling almost 11 acres. John Henley also features more than 23 acres of wildlife shrub and tree plots that are irrigated by a large 491 riser system, 244 acres of maintained native grasses and fields, 4 guzzlers, 4 wildlife habitat brush piles, and 2 gravel visitor parking lots with information kiosks. John Henley is primarily used for fishing, hiking, upland game bird and deer hunting, bird watching, and wildlife viewing. Vault toilet and primitive camping are available nearby at Riparia recreation area. Shotgun and archery only on south side of county road; rifle hunting is permitted on north side of county road. John Henley is also particularily attractive to pheasant hunters as it is an official pheasant release site for WDFW.

Figure 5-8. John Henley HMU

Skookum HMU. Used for fishing, hiking, hunting, bird watching, and wildlife viewing, Skookum HMU is only accessible by boat. Approximately 50 acres is under irrigation. The

vegetation consists of sagebrush, rabbit brush, cheatgrass and bunch grass in the uplands. Planted vegetation consists of mixed trees and shrubs, food plots, and pastures. Russian olive is being managed on Skookum under the same management strategy as 55 Mile HMU. The site supports a number of game species to include deer, pheasant and quail. The management goals for the future are to reduce Russian olive, control other invasive species and replace food crops with native plants that will provide the same ecosystem service.

5.3.2. Mitigation – Moderate Development

Ayer HMU. Ayer HMU is primarily used for fishing, upland bird hunting, bird watching, and wildlife viewing. Vegetation is sparse grassland with some dispersed shrubs, and topography is flat. There have been some native shrub plantings in the HMU, but establishment has been challenging without irrigation. Access by vehicle by Ayer Road off the Harvey Shaw/Clyde Road. The shoreline is used by waterfowl hunters. Other opportunities include nature watching, hiking and fishing. There are vault toilets, a boat ramp, and dry camping available in the adjacent Ayer Boat Basin.

Joso East HMU. Joso East features 2 guzzlers and various native shrub and tree plantings. The primary visitor activities at this unit include upland gamebird, waterfowl, and deer hunting.

Joso HMU. This HMU is very rocky with sparse vegetation due to the area's former use as a quarry. Habitat development has been limited with no vegetative planting, but a guzzler has been installed. It is used for fishing, hiking, hunting, bird watching, and wildlife viewing. The topography is relatively flat, however above the river there are steep eroding banks. The HMU may be accessed along private railroad property, but traffic is restricted with a gate at the entrance to the railroad's land. The preferred method of access is by boat, with primitive landing along the shore.

Lyons Ferry HMU. This HMU can be considered an area with limited habitat development. It features 5 guzzlers, several areas of native shrub and tree plantings, and a gravel parking lot for visitors. One of the largest HMUs, it also boasts some of the most diverse and productive wildlife habitat that can be found in the area. The habitats range from a standand shrub-steppe habitat found on its uplands and mesas, to a lush riparian habitat that accompanies the Palouse River as it flows through the extent of the unit. The primary visitor activities at this unit include fishing access, and upland gamebird, waterfowl, and deer hunting. This area is especially popular with anglers, as the Palouse River can be easily accessed by boat via the Snake River. The confluence of the Snake and Palouse rivers is know to be a productive walleye fishing area. Deer hunters have historically done well at this unit due to its size and varied landscape and habitats.

Figure 5-9. Lyons Ferry HMU

Riparia HMU. This HMU is an area with limited habitat development. Riparia features 4 goose nesting structures, areas of native habitat plantings, a fishing pond that is stocked regularly by WDFW, and a gravel parking lot for visitors. The primary visitor activities at this unit include fishing access, and upland gamebird, waterfowl, and deer hunting. Visitation is boosted by the nearby Riparia Recreation Area, which offers camping, a pit toilet, and an unimproved boat ramp.

Sixty Mile HMU. Sixty Mile is another example of an HMU with limited habitat development. It features a guzzler, areas of native plantings, and a gravel visitor parking lot. The primary visitor activities at this unit include fishing access, and upland gamebird, waterfowl, and deer hunting.

Figure 5-10. Guzzler at 60-Mile HMU

Tucannon HMU. Tucannon features 4 guzzlers, 3 goose nesting structures, a vault toilet, gravel parking lot for visitors, and extensive native shrub and tree plantings. This HMU is primarily used for fishing, hiking, upland game bird, waterfowl, and deer hunting, bird watching, and wildlife viewing. This is one of the rare HMUs where camping is allowed in the gravel parking lot. The popularity of the HMU is partly due to its location just off Highway 261, and the Tucannon River flowing through its extent. The confluence of the Tucannon and Snake rivers is also an area known for its superior walleye fishing.

Figure 5-11. Tucannon HMU

5.3.3. Mitigation – Limited Development

Magallon HMU. Used for fishing, hiking, hunting, bird watching, and wildlife viewing. Visitors can access the portion of the HMU across the railroad tracks from the shoreline via Magallon Road of the Lower Monumental Dam Road; however, parking is limited. The portions of the HMU along the shoreline are best accessed via boat; the railroad property should not be crossed.

Figure 5-12. Magallon HMU with view of Monumental Rock

Sargent HMU. Sargent HMUs is an example of a boat access only unit with limited development. This management strategy was intentional in the development of LSRFWCP HMU sites. The emphasis at these sites is invasive species control and fence maintenance. The primary visitor activities at this unit include fishing access, and upland gamebird, waterfowl, and deer hunting.

Texas Rapids HMU. Texas Rapids HMU features a guzzler, 2 wildlife habitat brush piles, areas of native wildlife plantings, and is located next to Texas Rapids Recreation Area. The primary visitor activities at this unit include fishing access, and upland gamebird, waterfowl, and deer hunting. The popularity for hunting visitation is boosted by the nearby recreation amenities offered such as camping, vault toilets, and a lighted boat ramp.

Figure 5-13. Texas Rapids HMU

Wild Rose HMU. This HMU is mainly accessed via boat and features some excellent bass fishing areas. Vegetation is sparse with dispersed shrubs due to the steep, rocky shoreline. This is good habitat for mule deer and upland birds, with little hunting pressure due to the difficulty of accessing most portions of the HMU.

Figure 5-14. Wild Rose HMU

5.4. ENVIRONMENTALLY SENSITIVE AREAS

ESAs are managed to protect the scientific, ecological, cultural, or aesthetic features, of the lands. Typically, limited or no development for public use is allowed. Manmade intrusions (power lines, non-Project roads, and water and sewer pipelines) are not permitted on lands classified as ESAs. Activities designed to promote and improve special features identified in the area are allowed, along with education and interpretation. There are a total of 792.4 acres designated under the ESA land classification. There were no lands classified as ESA in the 2019 classifications; ESA was not an approved land classification under the old nomenclature. The management areas in this land classification are shown in Table 5-4.

A total of 424.4 acres were previously classified as High Density Recreation, 151 acres as MRM-WM, and 102.6 acres previously unclassified. The management areas in this land classification are shown in Table 5-4. Detailed tables showing land classification changes by management area are provided in Appendix E.

Table 5-4. Environmentally Sensitive Areas

MANAGEMENT AREA	TOTAL ACRES
Alkali Flat Creek ESA	51.0
Palouse River ESA	115.1
Tucannon River ESA	83.4
Marmes Rockshelter NHL ESA	2.6
Palouse Canyon ESA	520.0
Wild Rose ESA	20.2
TOTAL	**792.4**

Alkali Flat Creek, Palouse River, and Tucannon River ESAs. These ESAs were designated due to their proximity to Endangered Species Act-listed-fish bearing streams and wetlands.

Marmes Rockshelter National Historic Landmark ESA. This ESA was designated due to its significance as a National Historic Landmark. Marmes Rockshelter was excavated in the 1960s, and provided valuable information on 10,000 years of prehistoric lifeways. The Corps constructed a levee in order to keep the site dry for future excavations, however, the levee failed and the site was flooded. The site is of ongoing importance to multiple Tribes, archaeologists, and the general public.

Palouse Canyon ESA. This ESA was designated due to its proximity to the Palouse Canyon Archaeological District and the Palouse Village (Canyon) TCP. Palouse Canyon is of ongoing importance to multiple Tribes, and is the location of important stories, legendary figures, and hunting, gathering, storage, living, and burial areas. The rugged topography is relatively undeveloped and provides a scenic expanse when viewed from Corps land or the adjacent Palouse Falls State Park.

Wild Rose ESA. This ESA was designated due to the presence of cultural resources of importance to multiple Tribes, features that are eligible for listing on the NRHP, and management concerns. There are two cattle watering corridors present in this area that bisect culturally sensitive areas. The Corps proposes to identify areas where fencing can be erected to direct cattle and protect cultural resources.

5.5. MULTIPLE RESOURCE MANAGEMENT

This MRM Lands classification allows for designation of a predominant use with the understanding that other compatible uses may also occur in the classification, to include

Low Density Recreation, Wildlife Management, and Future or Inactive Recreation Areas. Total MRM lands for the Project are approximately 2,545.8 acres. This is an increase in acreage from 1,912.6 previously. The management areas in this land classification are shown in Table 5-5, organized by subclassification.

The following changes were made to the MRM Lands classification: there were 9 land changes where land moved from MRM Lands into other classifications (1,454.2 acres), and 25 changes where land moved from other classifications into MRM Lands (2,216.6 acres). Detailed tables showing land classification changes by management area are provided in Appendix E.

Table 5-5. MRM Lands by Land Use Subclassification

MANAGEMENT AREA	TOTAL ACRES
MRM – LOW DENSITY RECREATION	
Little Goose North Shore Tailrace Recreation Area	1.0
Lower Monumental North	1.4
Lyons Ferry Natural Area	0.8
Riparia Park	13.5
Tucannon Recreation Area	2.9
TOTAL	**19.6**
MRM – WILDLIFE MANAGEMENT	
55 Mile HMU	187.4
Alkali Flat Creek HMU	117.4
Ayer HMU	108.0
Box Canyon HMU	131.0
Cow Bar Canyon HMU	16.9
Forebay Point HMU	10.0
Lyons Ferry HMU	524.6
Joso East HMU	64.6
Joso West HMU	19.8
Sargent HMU	84.8
Skookum HMU	250.4
Steamboat Bend HMU	346.9
Texas Rapids HMU	477.5
Wild Rose HMU	149.7
TOTAL	**2489.0**
MRM – FUTURE OR INACTIVE RECREATION AREA	
Lyons Ferry State Park Campground	37.2

5.5.1. MRM – Low Density Recreation

MRM-LDR are lands with minimal development or infrastructure that support passive public recreation use (e.g., primitive camping, fishing, hunting, trails, wildlife viewing, etc.). A total of 35.9 acres moved into MRM-LDR from other land use classifications: 14.3 acres from High Density Recreation, 2.9 acres from MRM-WM, 2.4 acres from Project Operations, and 16.3 acres not previously classified. Detailed tables showing land classification changes by management area are provided in Appendix E.

There are 5 sites under this classification encompassing approximately 19.6 acres.

Little Goose North Shore Tailrace Rec Area. Little Goose North Shore Tailrace is a multipurpose recreation area located at Snake RM 70 on the north shore in Whitman County, Washington. Access by vehicle from the north is along Little Goose Dam Road and limited access due to security from the south across Little Goose Dam. The Little Goose North Shore Tailrace Recreation Area falls within both Little Goose's and Lower Monumental's footprint. This 1 acre falls within Lower Monumental's footprint; the remaining 17.8 acres of the Little Goose North Shore Tail Race Recreation Area is within Little Goose's footprint.

Lower Monumental North. This point is a popular fishing spot on the north shore just downsteam of Lower Monumental Dam, off Devils Canyon Road and near the Columbia Plateau Trail. It sits across the river from Mathews.

Lyons Ferry Natural Area. Lyons Ferry Natural area is an access point located at Snake RM 59 on the north shore in Franklin County, Washington. This area has an unimproved gravel road leading to a shoreline fishing access site.

Riparia Park. Riparia is a multipurpose recreation area located at Snake RM 69 on the north shore in Whitman County, Washington. Access by vehicle from the north is along Little Goose Dam Road and limited access due to security from the south across Little Goose Dam. The area features now primitive campsites, fire pits, information kiosk, vault restroom, and shallow boat ramp. It's a popular camping spot due to shade provided by trees.

This is one of Lower Monumental's most unique sites with a rich history. The land under and around this park has historical significance unique to the area. Lewis and Clark camped near Riparia before navigating Texas Rapids in 1805. Steamboats began heavy traffic on the river in the 1860s. A businessman named Tom Bolen constructed a ferry to complete a link on the Texas Road, providing access between the Walla Walla and Palouse Districts. Bolen named his place "Texas Ferry", now known as Riparia, after the road and rapids. Later, residents changed it to Texas City. In the 1870s, wheat became a main cash crop, and thus

began the railroad boom. In 1881, the Oregon Railroad and Navigation Company extended its Walla Walla-Wallula route up the Snake River, terminating on the south shore opposite Texas City. People then referred to the communities on the river's two banks as a single town, either Texas City or Riparia, eventually giving preference to the latter. Riparia was an important location for transferring people and supplies from boat to train. In 1889 a bridge was built to connect people on both sides of the river, thus making Riparia an even more important junction. The remains of this bridge can be seen today. During its peak, Riparia had 100 residents, a store, three saloons, restaurant, hotel and post office. After about 1908, the railroads no longer frequented Riparia and it began to decline as a town. It eventually died completely in the 1960s, when the Corps removed its remaining buildings to prepare for the slack water behind Lower Monumental Dam.

Tucannon Recreation Area. Tucannon is a land access point located at RM 65 on the Tucannon River in Columbia County, Washington. Vehicle access along paved SR 261, then three miles north of Starbuck Washington. The area provides a parking lot, information kiosk and vault restroom which supports hiking, wildlife viewing, fishing, and hunting occurring at Tucannon HMU.

Figure 5-15. Tucannon Recreation Area

5.5.2. MRM – Wildlife Management

MRM-WM lands are designated for stewardship of fish and wildlife resources in conjunction with other land uses. Habitat maintenance and/or improvements are for a designated species, or group of species. A total of 1,454.2 acres moved out of the MRM–WM land classification from 2019: 151 acres moved into ESAs, 13.6 acres into High Density Recreation, 1,276.1 acres moved into Mitigation, 2.9 acres moved into MRM-LDR, and

10.6 acres moved into Open Recreation Waters. A total of 2,143.5 acres moved into MRM-WM from other land use classifications: 325 acres from High Density Recreation, 23 acres from Project Operations, and 1,795.5 acres not previously classified. Detailed tables showing land classification changes by management area are provided in Appendix E.

There are 14 sites under this classification encompassing approximately 2,489 acres. Many of the MRM-WM HMUs are paired with HMUs of the same name but classified as Mitigation. The Corps uses these lands to meet the ENS mission and provide fish and wildlife habitat, and in some cases, they can be credited to the mitigation requirements of the LSRFWCP. These "sister" HMUs are typically managed in a similar or even identical fashion, and it would be redundant to describe that management in two places in this document. For descriptions of the following HMUs, please see Chapter 5.3: **55 Mile, Ayer, Lyons Ferry, Sargent**, **Skookum, Texas Rapids,** and **Wild Rose** HMUs.

Figure 5-16. Sargent HMU

Figure 5-17. Texas Rapids HMU

Alkali Flat Creek HMU. Alkali Flat Creek is categorized as a limited habitat development HMU. The primary visitor activities at this unit include fishing access, and upland gamebird, waterfowl, and deer hunting. The area is particularily attractive to upland game bird hunters due to its historically high pheasant population. Alkali Flat Creek has been the site of extensive native shrub and tree plantings, primarily along its banks. The area is subject to large flash-flood events every 5 years or so, which can dramatically alter the topography and dominant vegetation.

Figure 5-18. Alkali Flat HMU

Box Canyon HMU. This HMU is north of Lower Monumental Dam and Devils Bench. It is very steep and rocky, with limited habitat development. Devils Canyon road (State Route 263) runs alongside the HMU. It features native shrubs and sparse grass among the rocks. The portion of the HMU near Devils Bench is flatter with more vegetation, but still sparse due to the semi-arid environment, which is especially harsh at this location.

Figure 5-19. Box Canyon HMU

Cow Bar Canyon HMU. This is a very small HMU east of Magallon HMU with no development. The lack of wildlife habitat development is because the HMU is completely landlocked by private lands and inaccessible to the public.

Forebay Point HMU. This HMU is on the south shore just upstream of Lower Monumental Dam, and accessible only by boat. It is used by bass fisherman. Habitat development in this HMU has been limited due to its inaccessibility by land.

Joso East HMU. Joso East HMU is managed like its sister mitigation HMU, except for the small pond created by overflow under the railroad bridge from Lyons Ferry Marina. Visitors to Lyons Ferry Marina often walk through the 7-foot culvert to reach this pond, which is also called Orchard Pond. The pond is stocked yearly by WDFW.

Figure 5-20. Joso East HMU

Joso West HMU. This is another very small HMU west of Joso HMU, also completely landlocked and with no habitat development. This HMU is inaccessible to the public.

Steamboat Bend HMU. This HMU can only be accessed via boat and features some fishing areas for bass and other warm water species. Vegetation is sparse with dispersed shrubs due to the steep, rocky shoreline. This is good habitat for mule deer and upland birds, with little hunting pressure due to the difficulty of accessing most portions of the HMU.

Figure 5-21. Steamboat Bend HMU seen from Ayer Boat Basin

5.5.3. MRM – Future or Inactive Recreation Areas

Lyons Ferry State Park Campground is the only area under the Future or Inactive Recreation Areas classification, and it encompasses approximately 37.2 acres. This area was identified as compatible for future recreational development, and was previously classified as High Density Recreation. Until there is an opportunity to further develop this area, this land will be managed under the MRM–FIRA classification.

5.6. WATER SURFACE ZONING

Water surface zoning at Lower Monumental Lock and Dam is used to support public safety and security. The water surface on Lake West includes the following zones: Restricted, Designated No-Wake, and Open Recreation. Open Recreation allows for recreation activities such as wading, swimming, paddling, sailing, motorboating, and fishing. There are 6,396.2 acres of water surface designated for Open Recreation. Water Surface acreage was not quantified in the 1966 Master Plan.

At Lower Monumental Lock and Dam, boat restricted zones (BRZ) have been set up below and above the dam to allow for Project operations, safety, and security. The waters are

restricted to all vessels, except government vessels. The BRZ is described as "all waters commencing at the upstream of the navigation lock guidewall and running in a direction of 46°25′ true for a distance of 344 yards; thence 326°19′ true for a distance of 362 yards; thence 243°19′ true for a distance of 218 yards; thence 275°59′ true to the north shore a distance of about 290 yards. The downstream limits commence at the downstream end of the navigation lock guidewall; thence to the north shore, at right angles and parallel to the axis of the dam. Signs designate the restricted areas," (33 CFR § 207.718). There are also boat restricted zones at Marmes Pond and Orchard Pond (in Joso East HMU). There are 109.2 acres of Restricted waters.

Zones near boat ramps are Designated No-Wake to protect recreational water access from disturbance and for public safety. The largest designated no-wake zone is in Lyons Ferry State Park Harbor. There are 65.8 acres of waters in Lake Bryan Designated No-Wake. Detailed tables showing land classification changes by management area are provided in Appendix E.

6. Special Topics, Issues, and Considerations

This chapter discusses the special topics, issues, and considerations identified as important to the future management of Lower Monumental Project. Special topics, issues, and considerations are defined in this context as any problems, concerns, and/or needs that could affect or are affecting the stewardship and management potential of the lands and waters under the jurisdiction of the Walla Walla District, Lower Monumental Project.

6.1. LOWER SNAKE RIVER FISH AND WILDLIFE COMPENSATION PLAN

The LSRFWCP has been discussed previously in several areas in this Master Plan. It was a negotiated mitigation settlement developed and implemented to provide compensation for hunting and fishing opportunity losses resulting from the construction and operation of the four lower Snake River dams (Ice Harbor, Lower Monumental, Little Goose, and Lower Granite), which impounded approximately 140 miles on the lower Snake River in Washington and Idaho. The LSRFWCP, published in June 1975, was authorized by the Water Resources Development Act of 1976, amended in WRDA 1986 to increase the project cost limit, and again in WRDA 2007 to add woody riparian restoration (Table 6-1). This plan, and its implementation strategies were developed by the Corps, in consultation with USFWS, to assure compliance with the Fish and Wildlife Coordination Act.

Table 6-1. Lower Snake River Fish and Wildlife Compensation Plan Authorizations

AUTHORIZATION	DATE
Original authorization by the Water Resources Development Act (WRDA) of 1976, Section 102, PL 94-587	October 22, 1976
amended by WRDA 1986, Section 856, PL 99-662	November 17, 1986
amended by WRDA 2007, Section 3165, PL 110-114	November 8, 2007

The plan as originally authorized was divided into two parts: fisheries compensation and wildlife compensation. Fisheries compensation centered on fish propagation facilities and providing fisherman access along tributary streams. The wildlife compensation involved on-Project lands habitat development, off-Project habitat acquisition, and the purchase and release of game farm birds (pheasants). Table 6-2 lists the primary accomplishments of the LSRFWCP from its inception in 1976 to the present.

The off-Project land acquisition was combined with the fisherman access to form the three components of the off-Project land acquisition program, described as X, Y, and Z lands in published documents. The original intent of the program was to acquire 8,400 acres of

upland game habitat and hunting lands (X lands), 15,000 acres of chukar habitat and hunting lands (Y lands), and 750 acres of fisherman access (Z lands). The acquisition of X, Y, and Z lands were completed in 1994, which included fishing and hunting access points. The game farm alternative was completed in 2007 after operating for several decades.

Hatchery construction and transfer to USFWS for long term operation and maintenance were completed in 2000, and the fishery satellite and acclimation facilities were completed in 2010. The on-Project lands habitat development has been ongoing, with ten of the twelve habitat indicator species habitats completed in 2012. The remaining habitats and species were scheduled to be completed in 2019. After 2019, construction general funds will no longer be appropriated, but the District will continue to use the O&M program to maintain and achieve LSRFWCP habitat goals and objectives. The long-term O&M program will be managed under the Operations Division.

Table 6-2. Summary of LSRFWCP Fisheries and Terrestrial Wildlife Accomplishments

ACCOMPLISHMENTS	DATE
Acquisition of XYZ Lands (Off-Project)	1994
Fishing Access	1994
Hunting Access	1994
Hatchery Construction/Transfer	2000
Habitat Development and Evaluation for 10 of 12 indicator species	2002
Game Farm Alternative	2007
Fish Acclimation Facility Construction/Transfer	2010
Habitat Evaluation Procedure/Gap Analysis	2013
Remaining 2 indicator species- riparian habitat developed	2019

A total of 54 management units were classified as wildlife lands along the impounded area of the Snake River. Ten HMUs were identified to be intensively developed (irrigation systems and plantings), 25 HMUs were to be moderately developed (dryland development with water guzzlers and fencing), and the remaining 19 units were to remain undeveloped or with limited development. Some of the wildlife units that were slated to remain undeveloped have had wildlife water guzzlers installed over the years. There are 14 sites of the 54 that are reserved for mitigation (Table 6-3) on Project lands.

Habitat restoration in the early stages of the LSRFWCP included planting non-native species—such as Russian olive—that grew aggressively, quickly creating food and cover for

birds and wildlife. Plantings have since evolved into a more sustainable, native species-focused approach.

Recent plantings have focused on palustrine forest and palustrine scrub-shrub habitat re-establishment, which are cover types that were not historically abundant in the Project area. Orchards in low lands became common in the early 20th century, up until the Project was constructed. Construction of the Project virtually eliminated these orchards and the limited amount of natural palustrine forest that remained.

HMUs that are affiliated with the Project include lands shown in Table 6-3. These lands were developed and/or purchased to provide hunting and fishing opportunities, and are classified as mitigation lands under this Master Plan in order to protect their status.

Table 6-3. Mitigation Areas under the LSRFWCP within Lower Monumental Lands and Their Corresponding Development Levels

MANAGEMENT AREA	ACRES	MANAGEMENT CLASSIFICATION
55 Mile HMU	305.9	Intensive Development
John Henley HMU	919.0	Intensive Development
Skookum HMU	229.4	Intensive Development
Ayer HMU	116.9	Moderate Development
Joso East HMU	43.2	Moderate Development
Joso HMU	330.5	Moderate Development
Lyons Ferry HMU	396.5	Moderate Development
Riparia HMU	160.3	Moderate Development
Sixty Mile HMU	221.0	Moderate Development
Tucannon HMU	279.4	Moderate Development
Magallon HMU	66.3	Limited Development
Sargent HMU	197.0	Limited Development
Texas Rapids HMU	136.9	Limited Development
Wild Rose HMU	240.8	Limited Development

6.2. INVASIVE SPECIES

The issue of invasive species, while not a new issue, has been a specific area of focus for the Corps in the last 10 years. Compliance with Corps regulations and the Endangered Species

Act led to the development of a District-wide IPMP, which was put into full effect in 2012. Approved pesticides, buffers from water, best management practices, and standardized pest management reporting were all presented in the comprehensive plan in 2012.

The Corps has also been working with the National Marine Fisheries Service (NMFS) and USFWS to complete Endangered Species Act consultations on the Aquatic Pest Management Program (the aquatic portion of the IPMP) since 2009, and consultations were completed in 2019. The Corps is working toward reintegration of treating aquatic invasive plant species into routine operations and maintenance. Because treatments have not occurred since 2009, the Corps faces some challenges and large infestations, and anticipates the need for some focused efforts to bring the invasive species back under control.

Additionally, the Corps has been engaged on a national level to help prevent the spread of invasive species with watercraft inspection stations (cost-share programs) and through education on zebra and quagga mussels. The Corps performs annual sampling and visual monitoring for adult zebra and quagga mussel at the dam. Monitoring occurs at various locations within the juvenile fish facility system at points determined to be of high risk of introduction. This informational data is shared within the region and with the 100th Meridian Initiative Columbia River Basin Team (an aquatic invasive species prevention organization) to inform future monitoring and sampling.

6.3. ENCROACHMENTS

Vegetation and livestock grazing encroachments are common violations on Corps-managed lands. This is primarily due to the rural and remote location of Project lands and the fact that property surrounding these lands are managed for agriculture and/or livestock. Figure 6-1 illustrates how trails can impact wildlife lands to include erosion and soil loss.

Figure 6-1. Hiker at Hells Gate HMU Trails; Effects of Trails on Soil Erosion

The Corps Natural Resources Management mission is to manage and conserve natural resources, consistent with ecosystem management principles, while providing quality public outdoor recreation experiences to serve the needs of present and future generations. Encroachments on Corps-managed Federal lands directly conflict with that mission. The Corps is, therefore, committed to resolving encroachments by the most expedient and effective means available. It is the intent of the District to recapture use of encroached upon public lands for Federal project operating purposes and general use and enjoyment of the public.

The general policy is to require removal of encroachments, restore the premises, and collect appropriate administrative costs and fair market value for the term of unauthorized use. Policies and procedures are described in the references specified in Northwestern Division Walla Walla District Office Memorandum 1130-1-9, Encroachment Action Handbook (Corps 2018). Exceptions to this general policy are set forth in ER 405-1-12, Real Estate Handbook, Chapter 8 (Corps 1999).

The purpose of the Encroachment Action Handbook is to prescribe policies and procedures for surveillance and safeguarding of Corps-managed lands and easements in order to prevent potential encroachments and to prescribe the actions necessary to remove or resolve existing encroachments. This handbook establishes a program to protect all resources on operating project lands.

6.4. SEDIMENT DEPOSITION ISSUES

Since construction of Lower Monumental Dam, sediment deposition has become a maintenance issue at the Corps-owned recreation sites at locations such as boat basins, boat ramps, and water intakes for irrigation in HMUs. The Programmatic Sediment Management Plan (PSMP) is a plan developed by the Corps to build a framework to address many of these issues.

The PSMP must provide a long-term plan to manage, and prevent if possible, the accumulation of sediment in area of the lower Snake River reservoirs that interferes with authorized Project purposes. Sediment accumulation interferes with the following authorized purposes of the lower Snake River projects:

- Recreation by limiting water depth at boat basins to less than original design dimensions.
- Fish and wildlife conservation by interfering with irrigation water intakes at HMUs.

The District recently received funding to pursue NEPA compliance under the PSMP for sediment management in various recreational boat basins across several Lower Snake projects, including the Project area. Boat basins in the Project which are slated for future sediment management work could include: Texas Rapids, Ayer Boat Basin, Riparia, and Devils Bench.

7. Agency and Public Coordination

This chapter provides information on the public involvement and extensive coordination within the Corps and other affected agencies and organizations, which is a critical requirement in the development or revision of a project Master Plan.

7.1. SCOPING

A public scoping process for the Lower Monumental Master Plan revision was initiated in August 2019. Approximately 95 letters and emails were sent to stakeholders (community groups, elected officials, government agencies, interested parties) inviting them to come to the public meetings and comment on the Master Plan update.

The Corps conducted two public scoping meetings to support an update to the Master Plan: one in Dayton, Washington, on August 20, 2019, and one in Pasco, Washington, on August 21, 2019. The scoping process was an opportunity to get input from the public and agencies about the vision for the Master Plan update and the issues that the Master Plan should address, where possible. Fewer than 10 people attended the meetings. During the scoping period, the Corps received about 140 suggestions and comments related to management issues and recreation at the Project. The majority of comments focused on the following:

- Recreational Opportunities.
- Treaty rights and preservation of cultural resources important to Tribes.
- Preservation of the historic ferryboat at Lyons Ferry
- Dam Removal.

Comments compiled from attendees at the public scoping meeting and other sources were used to prepare the draft Master Plan.

7.2. TRIBAL COORDINATION

On August 5, 2019, the Corps sent a letter offering government-to-government consultation and an invitation to public meetings to the Colville, the CTUIR, the Yakama, the Wanapum Band, and the Nez Perce Tribe. The Colville and the CTUIR provided written comments. In their written scoping comments, CTUIR asked for a meeting with Corps staff to address their comments. That meeting was held on January 30, 2020 at CTUIR Headquarters in Mission, Oregon.

The Colville provided comments on the text of the 1966 master plan and amendments. There were quite a few comments, and not all can be mentioned here, but they included to update the text regarding communication with Tribes, to add reference to TCPs, that replanting activities should use native plant species, and Tribal development, placement, and review of interpretative signage.

The Corps sent letters to the Colville, CTUIR, Yakama, the Wanapum Band, and the Nez Perce Tribe requesting review and comment on the Draft Lower Monumental Master Plan, Draft Finding of No Significant Impact (FONSI), and EA.

7.3. AGENCY INVOLVEMENT AND COORDINATION

All development will be coordinated with appropriate Federal, State, and local agencies throughout the planning process. Because Lower Monumental Dam affects interstate runs of anadromous salmonids (Pacific salmon and steelhead trout), valued both as commercial and sport fish, many Federal and state fish and wildlife agencies have taken part in the assessment and recommendation of compensatory measures for losses of fish resources resulting from the Project. These agencies are NMFS, USFWS, and WDFW.

7.4. THE U.S. ARMY CORPS OF ENGINEERS WEBSITE

The Corps developed a webpage (https://www.nww.usace.army.mil/Locations/District-Locks-and-Dams/Lower-Monumental-Lock-and-Dam/Lower-Monumental-Master-Plan/) to provide information, updates, and collect comments for the Master Plan update. The draft Master Plan with associated documents were placed on this webpage for the public to view.

7.5. THE DRAFT 2020 MASTER PLAN AND ENVIRONMENTAL ASSESSMENT

Comments received from review of the Draft Master Plan, Draft FONSI, and EA will be summarized with comment responses and included in Appendix F of the final 2020 Master Plan and in the final FONSI. The Master Plan and EA will then be finalized and submitted for approval.

8. Summary of Recommendations

This chapter provides the recommended land classifications for the updated Lower Monumental Master Plan at a detailed level (by each management area) and includes a list of recommendations for recreation, natural resources, and public outreach.

8.1. GENERAL

This updated Lower Monumental Master Plan presents an inventory of land resources and how they are classified, existing park facilities, analysis of resource use, anticipated influences of Project operation and management.

This Master Plan is a living document establishing the basic direction for management and development of the Project in agreement with the capabilities of the resource and public needs. The plan is flexible and allows for supplementation if changes are needed before the next Master Plan update. The Master Plan will be periodically reviewed to facilitate the evaluation and use of new information as it becomes available.

The Lower Monumental Master Plan will guide the use, development, and management of the Project in a manner that optimizes public benefits within resource potentials and the authorized function of the Project while remaining consistent with Corps policies, regulations, and environmental operating principles.

8.2. RECOMMENDATIONS

8.2.1. Proposed Land Classification Changes

The proposed land classifications for the 2020 Master Plan are summarized in the table below. Appendix E provides a full list of land classification changes for each management area within the Project and the reasons for these changes. Figure 8-1provides a visual representation of the land classification changes between 2019 and 2020.

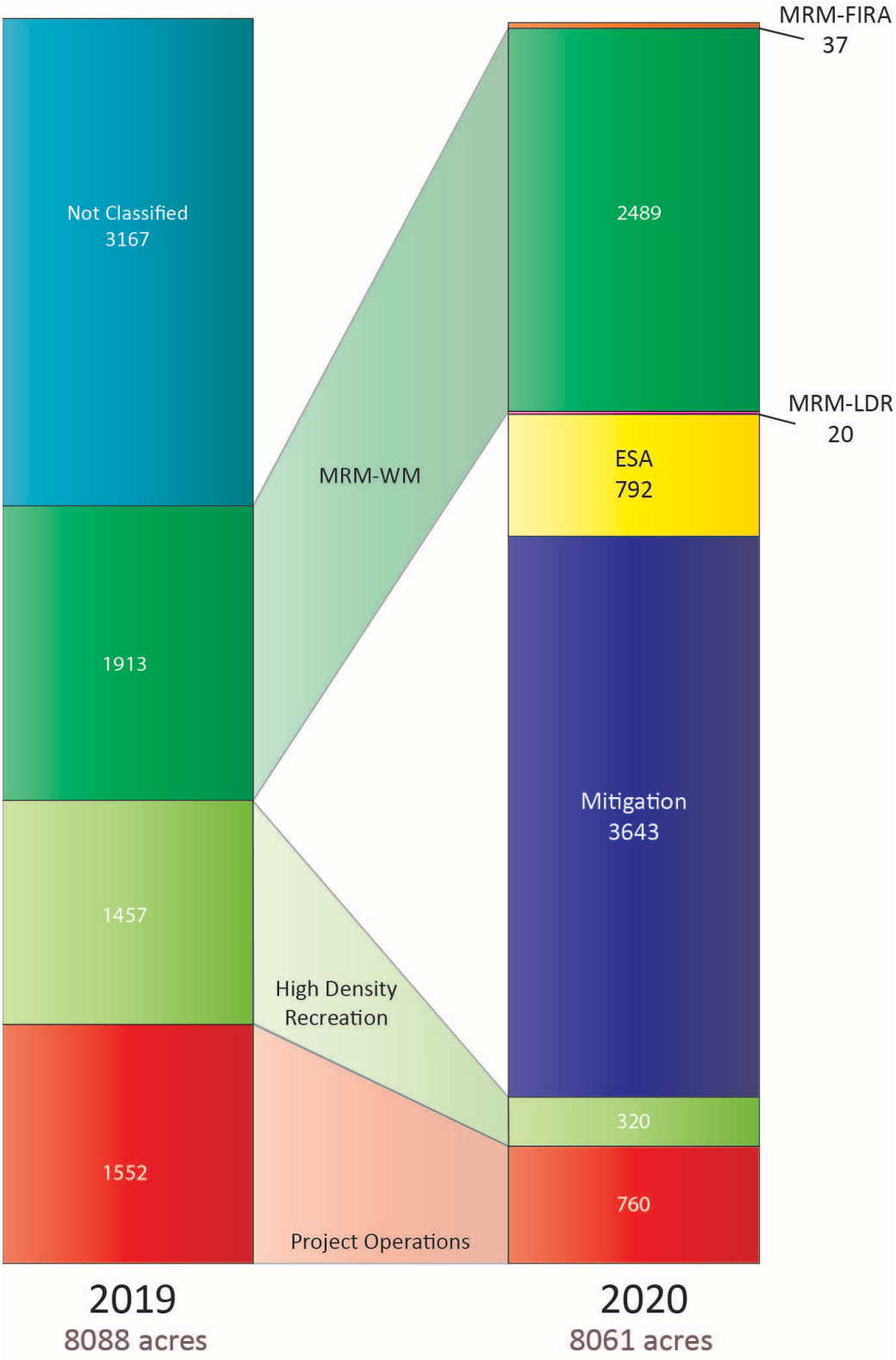

Figure 8-1. Visual Representation of Land Classification Changes between 2019 and 2020

8.2.2. Recreation Recommendations

The following recreation recommendations have been identified:

- Conduct regular surveys, counts, and other methods to collect data and monitor trends to determine user capacity and environmental sustainability.
- Address sediment deposition in boat basins, including Ayer Boat Basin and at Texas Rapids, according to the PSMP as funding becomes available, to maintain access to public lands.
- Continue to explore and integrate energy saving options such as solar and LED lighting.
- Improve visitor information through updating interpretive panels and kiosks, and updating website information using innovative technology (e.g., virtual tours).
- Assist Washington State Parks with their exploration of reopening camping at Lyons Ferry State Park. Assistance may be requested on recreation fee assessment and historic visitation trends.
- As funding becomes available, add larger group shelters in parks like Devils Bench, and add small shelters as space is available according to public demand in parks like Texas Rapids and Ayer Boat Basin.

8.2.3. Natural Resource Recommendations

The following natural resource recommendations have been identified:

- Invasive plant species can significantly degrade aquatic and wildlife habitat, increase soil erosion, and outcompete native species that fish and wildlife depend upon and that are culturally significant to Tribes. Species should be controlled using methods provided in the IPMP.
- Continue to enhance riparian and upland biodiversity through vegetation enhancement projects that focus on planting native trees, shrubs, and groundcovers.
- Persist in addressing encroachments in accordance with the guidance in the District Encroachment Action Handbook. It is Corps policy to use the minimum level of recourse necessary to gain voluntary compliance and achieve resolution of encroachments, and to employ the most efficient and cost-effective means of resolving encroachments.
- Pursue funding for boundary surveys while navigating the complex issues surrounding joint funding (appropriated funds from Congress with BPA approval of

matched funding). Well documented boundaries are essential to the effort to address encroachments on federal land.

- Continue collaboration with WDFW on habitat protection and improvement of LSRFWCP mitigation lands and ENS lands.
- Keep providing public access to federal lands for hunting, fishing, hiking, bird watching, and other nature-related activities.

8.2.4. Education, Information, and Public Safety Recommendations

The following education, information, and public safety recommendations have been identified:

- Use social media and other means of communication so users can access information that is pertinent to the Project (e.g., trail closures, hunting season, current conditions, special events). Keep up to date on emerging commucation methods.
- Seek opportunities to partner with regional Tribes, local youth organizations, volunteers, and other organizations to provide educational and interpretive signs, activities, and programming.
- Add educational and interpretive information to kiosks in parks and HMUs, such as adding lists of bird species specific to the area from ERDC surveys, or other wildlife/plant species of interest.
- Pursue public outreach opportunities such as county fairs, outdoor shows, and other events to educate the public on recreation and hunting and fishing opportunities available on Corps lands.
- Visitor safety and facility security are of the highest priority in Corps parks. Common issues stem from unsupervised juveniles and an increasing transient population. Alcohol, drug usage, and mental health issues are often catalysts for crime being perpetrated in Corps parks. Project staff will continue to provide visitor assistance patrols and work with local law enforcement partners. Additional security measures that may be taken include increased contracting with local law enforcement for additional patrols, installing gates on parks to control access during periods of darkness, and placing security cameras in high incident areas.
- Continue to use social media and kiosks to post relevant visitor safety information ("Know Before You Go"), such as warnings to avoid rattlesnakes, to bring plenty of water, sunscreen, and bug protection, and to let people know your whereabouts. Boaters should also be sure to have a float plan and to let someone know when to expect them back in case

of trouble. Many of the parks and HMUs in this Project are isolated with poor cell phone coverage so it is very important that visitors are prepared.

8.3. FUTURE DEMANDS

Recommendations in this Master Plan reflect current inventory data, recreation trends, and forecasts. As technology and public demand change and new recreational opportunities arise, Corps staff will investigate the feasibility of new activities and evaluate proposed changes and additions to this Master Plan for potential conflicts, opportunities, and environmental impacts.

9. Bibliography

Alminas, O.S.V., A. A. Cook, P. L. Gibert, and A. Engilis, Jr. 2010. Herpetofauna of the Lower Snake River Habitat Management Units: Results from the 2009 Field Season. A Report to the U.S. Army Corps of Engineers - Walla Walla District. Museum of Wildlife and Fish Biology, Department of Wildlife, Fish, and Conservation Biology. University of California, Davis.

Asherin, D.A. and J.J. Claar. 1976. Inventory of Riparian Habitats and Associated Wildlife Along the Columbia and Snake Rivers: volume IIIA. U.S. Army Corps of Engineers North Pacific Division. 183 pp.

BPA (Bonneville Power Administration), Reclamation (Bureau of Reclamation), and Corps (U.S. Army Corps of Engineers). 2009. Systemwide Programmatic Agreement for management of Historic Properties Affected by the Multipurpose Operations of Fourteen Projects of the Federal Columbia River Power System for Compliance with Section 106 of the National Historic Preservation Act. On file at BPA, Portland, Oregon.

Bureau of Labor Statistics. 2019. Consumer Price Index. Available: http://www.bls.gov/cpi/#tables. Accessed May 4, 2019.

Cannell, K.G. 2000. Results of the Cultural Resource Inventory of Little Goose Reservoir. Prepared for the U.S. Army Corps of Engineers, Walla Walla District by the Nez Perce Tribe Cultural Resource Program, Lapwai, Idaho.

Center for Northwest Anthropology. 1992. The Results of the 1992 Drawdown Monitoring Project in Lower Granite, Little Goose, and John Day Reservoirs. Prepared for the U.S. Army Corps of Engineers by the Washington State University, Pullman, Washington.

Corps. 1966. Design Memorandum No. 7B, Master Plan for Development and Management of Lower Monumental Reservoir, Snake River, Washington. Walla Walla District, Walla Walla, Washington.

_____. 1969. Supplement No. 1 to Design Memorandum No. 7B, Master Plan for Development and Management of Lower Monumental Reservoir, Snake River, Washinton. Walla Walla District, Walla Walla, Washington.

_____. 1975. Special Report – Lower Snake River Fish and Wildlife Compensation Plan, Snake River, Washington and Idaho. Walla Walla District, Walla Walla, Washington.

_____. 1979. Design Memorandum for Wildlife Habitat Development, Supplement No. 1, Lower Snake River Project. Walla Walla District, Walla Walla, Washington.

_____. 1980. Lower Snake River Fish and Wildlife Compensation Design Memorandum No. 2A, Wildlife Compensation and Fishing Access, Real Estate. Walla Walla District, Walla Walla, Washington.

_____. 1995. Columbia River System Operation Review, Final Environmental Impact Statement Main Report. North Pacific Division. DOE/EIS-0170.

_____. 1996. EP 1130-2-550, Recreation Operations and Maintenance Guidance and Procedures, November 1996.

_____. 1999. ER 405-1-12, Real Estate Handbook, August 1999.

_____. 2002. Lower Snake River Juvenile Salmon Migration Feasibility Study – Appendix B – Resident Fish. Walla Walla District, Walla Walla Washington.

_____. 2018. Northwestern Division Walla Walla District Office Memorandum 1130-1-9, Encroachment Action Handbook. Walla Walla District, Walla Walla, Washington.

_____. 2019a. Economic Guidance Memorandum, 19-03, Unit Day Values for Recreation for Fiscal Year 2019, dated 18 October 2018: https://planning.erdc.dren.mil/toolbox/library/EGMs/EGM19-03.pdf.

_____. 2019b. Pest Management. Accessed July 11, 2018, http://www.nww.usace.army.mil/Missions/Projects/Pest-Management/. Walla Walla District, Walla Walla, Washington.

Draper, J. and D. Brauner. 1989. Archaeological Survey and Reevaluation of Prehistoric Sites within the Palouse Canyon Archaeological District. Department of Anthropology, Oregon State University, Corevallis, Oregon.

Engilis, I. E., A. Engilis, Jr., O. S. V. Alminas, and A. A. Cook. 2010. Diversity and Distribution of Small Mammals in U. S. Army Corps of Engineers Habitat Management Units of the Lower Snake and Columbia Rivers, Washington, 2009 Field Season.. Museum of Wildlife and Fish Biology. Dept of Wildlife, Fish and Conserv. Biology Universityof California, Davis.

Environmental Protection Agency (EPA). 2018. Ecoregions. Accessed June 14, 2020, https://www.epa.gov/eco-research/ecoregions

Fischer, R.A., J.J. Valente, M.P. Guilfoyle, S.S. Jackson, J.T. Ratti, and M.D. Kaller. 2010. Factors Influencing Bird Communities on U.S. Army Corps of Engineers Properties along the Snake and Columbia Rivers in Southeastern Washington. Contract Report prepared for U.S. Army Corps of Engineers District, Walla Walla, by the Environmental Laboratory, U.S. Army Engineer Research and Development Center, Vicksburg, MS.

Foster Wheeler Environmental Corporation, Columbia River Inter-Tribal Fish Commission, and Meyer Resources, Inc. 1999. Lower Snake River Juvenile Salmon Mitigation Feasibility Study: Tribal Circumstances and Perspectives of the Nez Perce, Yakama, Umatilla, Warm Springs and Shoshone Bannock Tribes. Prepared for the U.S. Army Corps of Engineers by Foster Wheeler Environmental Corporation, Columbia River Inter-Tribal Fish Commission, and Meyer Resources, Inc., Bellevue, Washington.

George, Matilda, editor. 2003. Native American Place Names Along the Columbia River Above Grand Coulee Dam, North Central Washington and Traditional Cultural Property Overview Report For the Confederated Tribes of the Colville Reservation. Confederated Tribes of the Colville Reservation History/Archaeology Program, Nespelem, Washington. Revised May 2011. Available online at https://www.cct-hsy.com/place-name/

Hicks, B. 1994. Archaeologial Studies in the Palouse Canyon Archaeological District, 1993 Field Season, Volume 1. Prepared for the U.S. Army Corps of Engineers by BOAS, Inc, Seattle, Washington.

_____. 2000. Lower Snake River Reach Cultural Resources Management Plan. Prepared for the U.S. Army Corps of Engineers by Confederated Tribes of the Colville Reservation History/Archaeology Department, Nespelem, Washington.

_____. 2003. Marmes Rockshelter: A Final Report on 11,000 Years of Cultural Use. Prepared for the U.S. Army Corps of Engineers by Confederated Tribes of the Colville Reservation History/Archaeology Department, Nespelem, Washington.

Historical Research Associates, Inc. 2015. A Systemwide Research Design for the Study of Historic Properties in the Federal Columbia River Power System. Prepared for the Federal Columbia River Power System, Cultural Resources Program. Available Online: https://www.bpa.gov/efw/CulturalResources/FCRPSCulturalResources/Pages/Program-Documents.aspx

Hunn, E.S., E.T. Morning Owl, P.E. Cash Cash, and J. Karson Engum. 2015. Ĉáw Pawá Láakni, They Are not Forgotten, Sahaptian Place Names Atlas of the Cayuse, Umatilla, and Walla Walla. University of Washington Press, Seattle, WA.

Kennedy, D. and R.T. Bouchard. 1998. Northern Okanagan, Lakes and Colville. In Plateau, edited by Deward E. Walker, Jr., pp. 238-252. Handbook of North American Indians, Volume 12, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

LibbyMT.com. 2012. Lake Koocanusa. Accessed at http://www.libbymt.com/areaattractions/lakekoocanusa.htm.

Loper, S. and K. Lohman. 1998. Distribution and Abundance of Amphibians and Reptiles in Riparian and Upland Habitats Along the Lower Snake River. Report prepared for the U.S. Army Corps of Engineers, Walla Walla District, Walla Walla, Washington. February, 1998. 46 pp.

MFWP. 2018. 2018 Annual Visitation Report.

_____. 2017. 2017 Annual Visitation Report. Available online at: http://stateparks.mt.gov/about-us/parksData.html. Accessed 1/2/19.

Miller, C.L. 2001. Lower Monumental Reservoir Cultural Resource Inventory Survey Report. Prepared for the U.S. Army Corps of Engineers by the Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon.

Miller, J. 1998. Middle Columbia River Salishans. In Plateau, edited by Deward E. Walker, Jr., pp. 253-270. Handbook of North American Indians, Volume 12, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Nez Perce Tribe. 2003. Treaties Nez Perce Perspectives. Nez Perce Tribe Environmental Restoration and Waste Management Program, in association with the Department of Energy and Confluence Press.

NMFS. 2013. Reinitiation of the Endangered Species Act Section 7 Formal Programmatic Conference and Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Aquatic Restoration Activities in the States of Oregon and Washington (ARBO II). Biological Opinion of the National Marine Fisheries Service, Northwest Region, Portland, Oregon.

___. 2017. ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon (Oncorhynchus tshawytscha) & Snake River Basin Steelhead (Oncorhynchus mykiss). National Marine Fisheries Service, West Coast Region, Portland, Oregon.

NPS (National Parks Service). 2019. Recreation Visitors by Month: Lake Roosevelt NRA. Available online at: https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Recreation%20Visitors%20By%20Month%20(1979%20-%20Last%20Calendar%20Year)?Park=LARO. Accessed 1/7/19.

_____. N.d. Lake Roosevelt: Boating. Accessed at https://www.nps.gov/laro/planyourvisit/boating.htm.

Osborne, D. 1948. An Appraisal of the Archaeological Resources of Ice Harbor, Lower Monumental, Little Goose, and Lower Granite Reservoirs, Snake River, Washington. Columbia Basin Project, River Basin Surveys, Smithsonian Institution.

Plamondon II, M. 2001. Lewis and Clark Trail Maps: A Cartographic Reconstruction, Volume II. Washington State University Press, Pullman, Washington.

Reid, K.C. 1995. An Overview of the Cultural Resources in the Snake River Basin: Prehistory and Paleoenvironments (1st Update). Prepared for the U.S. Army Corps of Engineers by Rainshadow Research Inc., Pullman, Washington.

Rockledge, A.M. and J.T. Ratti. 1998. Lower Snake River Wildlife Studies: Analysis of Lower Snake River Habitats and Their Ecological Value to Birds and Small Mammals. U.S. Army Corps of Engineers Walla Walla District. 102 pp.

_____. 2000. Avian Use of Recently Evolved Riparian Habitat on the Lower Snake River, Washington. Northwest Science 74:286-293.

Schalk, R.F. and M.A. Nelson. 2016. Archival Research and Site Analysis Walla Walla District Grave Relocation Projects. Prepared for the U.S. Army Corps of Engineers, Walla Walla District, by Cascadia Archaeology, LLC and Applied EarthWorks, Inc., Seattle, Washington and Albany, Oregon.

____. 2013. Archaeological Survey of Habitat Management Units along the Lower Snake River, Washington. Prepared for the U.S. Army Corps of Engineers by Applied EarthWorks and Cascadia Archaeology, Albany, Oregon, and Seattle, Washington.

Scheuerman, R.D. and C.E. Trafzer. 2015. River Song, Naxiyamtáma (Snake River-Palouse) Oral Traditions from Mary Jim, Andrew George, Gordon Fisher, and Emily Peone. WSU Press, Pullman, Washington.

Schuster, H.H. 1998. Yakima and Neighboring Groups. In Plateau, edited by Deward E. Walker, Jr., pp. 327-351. Handbook of North American Indians, Volume 12, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Sprague, R. 1998. "Palouse." In Handbook of North American Indians, Volume 12, Plateau, edited by D.E. Walker, Jr., pp. 352-359. Smithsonian Institution, Washington, D.C.

Stern, T. 1998. Cayuse, Umatilla, and Walla Walla. In Plateau, edited by Deward E. Walker, Jr., pp. 395-419. Handbook of North American Indians, Volume 12, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Taylor, D. 2000. Status of the Yellow-Billed Cuckoo in Idaho. Western Birds 31:252-254.

Trumbo, B. 2018. Personal communication, February 22, 2018.

USFWS. 2008. Species Assessment and Listing Priority Assignment Form: Coccyzus americanus.

_____. 2010. Additional Information: Final Critical Habitat Designation for Bull Trout in Idaho, Oregon, Washington, Montana and Nevada. U.S. Fish and Wildlife Service, Boise, Idaho.

Walker, D.E., Jr. 1998. "Nez Perce." In Handbook of North American Indians, Volume 12, Plateau, edited by D.E. Walker, Jr., pp. 420-438. Smithsonian Institution, Washington D.C.

Washington State Recreation and Conservation Office. 2018. State Recreation and Conservation Plan, https://www.rco.wa.gov/StateRecPlans/scorp/, accessed February 24, 2020.

Water Resources Council.1983. Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies.

Wiken, E., F. J. Nava, and G. Griffith. 2011. North American Terrestrial Ecoregions—Level III. Commission for Environmental Cooperation, Montreal, Canada. Available at: ftp://ftp.epa.gov/wed/ecoregions/pubs/NA_TerrestrialEcoregionsLevel3_Final-2june11_CEC.pdf.