RESTORATION PLAN
CITY OF RICHLAND SMP UPDATE

Prepared for

City of Richland

Prepared by

Anchor QEA, LLC
8033 West Grandridge Boulevard, Suite A
Kennewick, Washington 99336

Prepared with assistance from

Parametrix, Inc.

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LIST OF ACRONYMS AND ABBREVIATIONS

BLM	Bureau of Land Management
BOR	Bureau of Reclamation
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DNR	Washington State Department of Natural Resources
EPA	Environmental Protection Agency
NOAA	National Oceanographic and Atmospheric Administration
OHWM	Ordinary High Water Mark
RCW	Revised Code of Washington
SIAC	Shoreline Inventory, Analysis, and Characterization Report
SMA	Shoreline Management Act
SMP	Shoreline Master Program
TMDL	Total Maximum Daily Loads
TNC	The Nature Conservancy
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USDA	U.S. Department of Agriculture
USDOE	U.S. Department of Energy
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WSCC	Washington State Conservation Commission
YRBWEP	Yakima River Basin Water Enhancement Program

1 INTRODUCTION

This Restoration Plan (Plan) has been prepared in support of the City of Richland's (City's) Shoreline Master Program (SMP). The SMP is being prepared to comply with the Washington State Shoreline Management Act (SMA or the Act) requirements (Revised Code of Washington [RCW] 90.58) and the state's SMP guidelines (Washington Administrative Code [WAC] 173-26, Part III-201 2[f]), which were adopted in 2003. The City of Richland SMP is composed of policies and regulations that regulate the use and development of the river, stream, and lake shorelines and this Plan. The area covered by this Plan includes the SMP jurisdiction within Richland.

The scope of this document, the definition of restoration, and the key elements in restoration planning in the SMP process are discussed next.

1.1 Purpose and Scope of Plan

The purpose of this Plan is to describe how and where shoreline ecological functions can be restored within City SMP jurisdiction. The SMP guidelines (WAC 173-26-201(2)(f)) articulate that the Plan is to include specific elements, which are identified below along with the section in which the element occurs in this Plan:

1) An identification of degraded areas, impaired ecological functions, and sites with potential for ecological restoration – Section 4
2) An establishment of overall goals and priorities for restoration of degraded areas and impaired ecological functions – Section 4
3) An identification of existing and ongoing projects and programs that are currently being implemented that are designed to contribute to local restoration goals (such as capital improvement programs and watershed planning efforts – Section 3
4) An identification of additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs – Sections 4 and 5
5) An identification of timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals – Section 5
6) Provisions for mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the

effectiveness of the projects and programs in meeting the overall restoration goals – Section 5

While the Plan incorporates elements of other shoreline restoration planning documents that involve the shorelines under the City's SMP jurisdiction, the scope of this Plan under the SMA guidance does not extend to that of a master document combining and aligning priorities of other shoreline restoration documents, plans, or efforts. It is expected that alignment or conflict between this Plan and the goals of other plans (such as Comprehensive Plans) that occurs during implementation will be addressed within the context of the applicable regulations.

It is important to clarify that restoration as it is discussed here is distinct from the concept of protection or no net loss. The WAC defines "restoration" or "ecological restoration" as follows:

> *"…the reestablishment or upgrading of impaired ecological shoreline processes or functions. This may be accomplished through measures including, but not limited to, revegetation, removal of intrusive shoreline structures and removal or treatment of toxic materials. Restoration does not imply a requirement for returning the shoreline area to aboriginal or pre-European settlement conditions."*

The state's SMP policies include a standard of no net loss of ecological functions that are necessary to sustain shoreline natural resources that must be adhered to by new SMPs. The Washington State Department of Ecology (Ecology) has clarified that no net loss means that "establishing uses or conducting development are identified and mitigated with a final result that is no worse than maintaining the current level of environmental resource productivity" and "no uses or development supersede the requirement for environmental protection" (Ecology 2004). Thus, mitigation activities are the method by which no net loss is compensated. The distinction between no net loss and SMP restoration is that restoration goes beyond no net loss by establishing an increase in the amount, size, and/or functions of an ecosystem or components of an ecosystem compared to a baseline condition (Thom et al. 2005). Therefore, mitigation activities, including re-development and new development that include mitigation activities, could not be considered as part of restoration under this Plan unless there was a 'beyond no net loss' component to the work.

1.2 Key Elements of Restoration Planning in Shoreline Master Program Process

The state's SMP guidelines state that the SMP must give preference to certain shoreline uses, in the order as follows: 1) reserve appropriate areas for protecting and restoring ecological functions to control pollution and prevent damage to the natural environment and public health; 2) reserve shoreline areas for water-dependent and associated water-related uses; 3) reserve shoreline areas for other water-related and water-enjoyment uses that are compatible with ecological protection and restoration objectives; 4) locate single-family residential uses where they are appropriate and can be developed without significant impact to ecological functions or displacement of water-dependent uses; and 5) limit non-water-oriented uses to those locations where the above described uses are inappropriate or where non-water-oriented uses demonstrably contribute to the objectives of the Shoreline Management Act (WAC 173-26-201(2)(d)).

The guidelines also state that SMPs are to "include goals, policies and actions for restoration of impaired shoreline ecological functions" (WAC 173-26-186). The impaired functions are to be identified based on a detailed inventory and characterization of the shoreline ecosystem, and a restoration plan is to be formulated based on that information (WAC 137-26-201). The results of the inventory assessment were presented in the *Shoreline Inventory, Analysis, and Characterization Report* (SIAC Report) for Richland (Anchor QEA 2013). This Plan uses the information from the SIAC Report to address the restoration plan requirements discussed in the SMP guidelines. This Plan is not a regulatory document or a set of regulatory requirements. However, the SMP points to this Plan as a guide outlining opportunities for improving shoreline ecological function.

2 BACKGROUND

The City of Richland is located at the confluence of the Yakima and Columbia rivers, and is part of the Tri-Cities Metropolitan Area of Richland, Pasco, and Kennewick. The City is within Benton County and contains 25,197 acres in the current incorporated limits and additional 5,433 acres in the Urban Growth Area (UGA) (Anchor QEA 2013).

2.1 Planning Area Characteristics

Much of the Columbia River shoreline and portions of the Yakima River shoreline are owned by the U.S. Army Corps of Engineers (USACE) as part of the McNary Dam project with large portions of the federal ownership leased to the City as park and open space. There are several parks and nature preserves on the Yakima River, as well as many parks and greenspaces on the Columbia River. The natural open space system includes most of the Yakima River and Columbia River shorelines, islands, greenways, and designated areas within residential developments. The City also contains a portion of the Tapteal Greenway, which runs along the Yakima River from Benton City to Columbia Point.

Land cover in Richland dominated by developed areas (42 percent) and shrub/scrub habitat (31 percent), with agriculture (18 percent) occupying a significant percentage. Other land cover types include open water (8 percent), wetlands (1 percent), and forested areas (0.06 percent). Residential use comprises about 23 percent of the land area, industrial and business park about 20 percent, commercial/retail about 5 percent, natural open space about 8 percent, and developed open space about 7.4 percent (Anchor QEA 2013).

2.1.1 Geology

The geology, soils, and topography of the Richland area are primarily dictated by the Missoula Floods, glacial outburst flooding that occurred approximately 18,000 to 20,000 years before present. The geologic makeup is the result of erosion of pre-Floods geologic units, deposition of sediments carried by the floodwaters, and the formation of the unique topographic features that influence present-day hydrology. Prior to the Floods, the geology of the County consisted primarily of Miocene-aged Columbia River Basalt (CRB) flows that were in some places (e.g., plateaus) capped with varying thicknesses of wind-blown fine

sands and silt known as loess (Grolier and Bingham 1978). The segments of the Yakima and Columbia rivers around Richland are located in a wide valley that is comprised primarily of alluvial soils with relatively high infiltration rates. Within upland areas, particularly areas farther from the confluence of the river, outburst flood deposits of gravel occur as well.

2.1.2 Climate

The City falls within the Central Basin region of Washington, which has the lowest precipitation rates within Washington State. Annual precipitation in the Richland area averages around 7.15 inches and precipitation is commonly associated with summer thunderstorms and winter rains and snowfall. Snowfall depths rarely exceed 2 to 3 inches and occur from November to March. High temperatures in January can range from 35 to 45 degrees Fahrenheit (1.6 to 7.2 degrees Celsius [°C]) with low temperatures between 20 to 30 degrees (-6.7 to -1.1 °C). Summer high temperatures are usually in the high 80s to low 90s with low temperatures in the high 50s (WRCC 2012).

2.1.3 Water Resources

The planning area is located in the lower Yakima River basin (Water Resource Inventory Area 37). Major surface water resources are the Yakima River and Columbia River.

2.1.4 Yakima River

The Yakima River at Kiona has an average annual flow of 3,497 cubic feet per second (cfs) for its 78-year period of record (1934 to present; USGS 2012), draining a basin area of 5,615 square miles at this gage. Yakima River hydrology in the planning area is affected by the Yakima Project. River hydrology in the City is affected by the Yakima Project, which is a reservoir system that stores natural flow in the upper Yakima River and Naches River basins for release during high-demand periods. The storage and release cycle typically causes higher than natural flows in the late summer and fall and lower than natural flows in the spring and early summer. Additionally, the river receives return flow from water use in the upper Yakima River and Naches River basins. The Yakima Project reservoir system also captures floods in the upper basin.

The Integrated Water Resource Management Plan (Integrated Plan) is a currently proposed approach to improve water management in the Yakima River basin, aiming to improve fish and wildlife habitat, and increase operational flexibility to manage instream flows for ecological and human uses (USBR and Ecology 2011).

2.1.5 Columbia River

The Columbia River is the other major surface water resource within the City. The portion of the Columbia River within the City is part of the upstream portion of Lake Wallula. Lake Wallula was created from the impoundment of the Columbia River by McNary Dam. The active continuous USGS gage nearest to the planning area is gage #12514500 (Columbia River on Clover Island at Kennewick, Washington). The Columbia River at this gage drains 104,000 square miles. This gage is a water surface elevation gage and has records from Water Year 1988 to present. The water surface elevation at this gage ranges from 335 feet to 344 feet (NGVD 1929).

Because the planning area is within the Lake Wallula portion of the Columbia River, water levels are generally stable. Columbia River floodplain levels are also confined due to river regulation and levees in some areas.

3 EXISTING RESTORATION PLANNING, PROGRAMS, AND PARTNERS

This section describes the range of restoration planning, programs, and partners at work in the Richland area.

There is a sizable body of literature on recent habitat and environmental planning that pertain to shoreline ecosystems, flora, and fauna in the region. These documents collectively describe a number of plans, projects, and status of the science. The documents are:

- *Assessment of the Lower Yakima River in Benton County, Washington* (Benton Conservation District 2011)
- *Interim Comprehensive Basin Operating Plan for the Yakima Project* (USBR 2002)
- *Interior Columbia Basin Strategy* (ICBEMP 2003)
- *Yakima River Basin Study - Integrated Water Resource Management Plan* (USBR and Ecology 2011)
- *Yakima River Basin Integrated Water Resource Management Plan Final Fish and Wildlife Coordination Act Report* (USFWS 2012)
- *Yakima Subbasin Plan* (YSFWPB 2004)
- *Yakima Steelhead Recovery Plan* (NMFS 2009)
- *Yakima Bull Trout Action Plan* (YBFWRB et al. 2012)
- Link, S.O., W.H. Mast, and R.W. Hill, 2006. Shrub-steppe. Restoring the Pacific Northwest,
- D. Apostol and M. Sinclair, editors, pp. 216-240. Island Press, Washington D.C.
- USFWS (U.S. Fish and Wildlife Service), 2008. The Final Hanford Reach National Monument Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2008)
- USACE McNary Shoreline Management Plan (USACE 2011)
- Columbia Park West Master Plan (City of Richland 2010)
- Richland Parks and Recreation Commission Meeting #2-2012 minutes (City of Richland 2012a)
- City of Richland W.E. Johnson Master Plan (City of Richland 2012b)

Many groups are involved in shoreline restoration and protection in the region containing the City, including the federal and state government, the Benton Conservation District, and

the local cities and towns. A list of the key groups and their contributions is included in brief below in alphabetical order. This is intended to be a list of key parties and may not name all groups that have contributed to shoreline restoration or protection in the past and may in the future, as there may be others that arise, or that Anchor QEA is unaware of at this time.

3.1 Benton Conservation District

The Benton Conservation District (District) helps landowners to develop solutions to local resource (e.g., soil, air, water) concerns through providing technical and financial assistance. In 2011, the district completed an assessment of the lower Yakima River to investigate the aquatic habitat needs, riparian restoration, fish screening needs, and beneficial uses of the lower Yakima River basin (Benton Conservation District 2011).

3.2 Confederated Tribes of the Umatilla Indian Reservation

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) is a fish and wildlife co-manager of the mid-Columbia Basin. The CTUIR works for the protection and enhancement of treaty fish, wildlife, and habitats within the City of Richland and the region for present and future generations.

3.3 Washington State Recreation and Conservation Office

The Washington State Recreation and Conservation Office (RCO), formerly the Interagency Committee for Outdoor Recreation, administers the Salmon Recovery Funding Board for funding habitat protection and restoration projects, and associated activities to benefit salmon (also see Washington state, below).

3.4 National Oceanographic and Atmospheric Administration Fisheries

The National Oceanographic and Atmospheric Administration Fisheries (NOAA Fisheries) leads recovery efforts for populations of salmon and steelhead in Washington and other states, which often includes consideration of protection and restoration of shoreline habitat that supports various life stages of these fish. NOAA Fisheries also administers the

Watershed Program, which evaluates the effectiveness of habitat and watershed restoration strategies or techniques.

3.5 Nonprofit Groups

Washington Trout is a nonprofit conservation ecology organization who seeks to preserve, protect, and restore Washington's wild fish and their habitats. Ducks Unlimited actively restores wetland, riparian and other floodplain habitats throughout the lower Yakima River subbasin. The Mid-Columbia Fisheries Enhancement Group is involved in improving fish passage conditions at the mouth of the Yakima River, including at Bateman Island. Tapteal Greenway works to sustain the Tapteal corridor/trail along the Yakima River from Benton City (Kiona Bridge at river mile [RM] 29.9) to the river's mouth, including the corridor within the City of Richland. Pheasants Forever contributes to the restoration of grasslands to benefit upland game birds.

The Nature Conservancy (TNC) restores and protects land in Benton County for the benefit of shrub-steppe habitat and wildlife, also allowing educational, research, and permitted recreational uses on its properties. Many shrub-steppe habitats are within the shoreline jurisdiction of the SMP. The Columbia Plateau Ecoregional Assessment (TNC 1999) identified a group of sites that could maintain biota and community viability, and provided an assessment of risks and strategies to conserve biodiversity in the area.

3.6 U.S. Army Corps of Engineers

USACE administers federal shoreline lands in Richland. The City leases and manages much of the land owned by USACE and complies with provisions to protect and manage resources on these lands. In coordination with the USACE, the City is in the process of developing and implementing a vegetation management plan for City parks and recreation areas (including developed and undeveloped lands) that protects ecological functions and will result in no net loss of these functions through operations, maintenance, and restoration actions in these areas. This plan includes integrated vegetation management for control of invasive weeds and replacing existing invasive species with native or compatible species.

3.7 U.S. Bureau of Land Management

The U.S. Bureau of Land Management (BLM) administers federal lands in Benton County. In its land acquisitions, the bureau targets shrub-steppe and associated riparian zones, and BLM policy gives priority to habitat for sensitive species and riparian areas. The BLM implements the Interior Columbia Basin Strategy, aimed at managing eastside forests in a scientifically-sound and ecosystem-based manner. It also implements integrated weed management, including shoreline areas.

3.8 U.S. Bureau of Reclamation

The U.S. Bureau of Reclamation (USBR) manages the federal Yakima Project, operating a dam and reservoir system for irrigation water supply, instream flows, and flood. The Yakima Project provides irrigation water for much irrigated land that extends along the Yakima River. The Yakima River Basin Water Enhancement Program (YRBWEP), administered by the USBR, demonstrates water conservation and fisheries enhancement by working with stakeholders in the basin. Ecology, the Yakama Nation, Bonneville Power Administration, and Natural Resource Conservation Service are all partners in the program, and local irrigation districts have been regular participants in the YRBWEP's activities.

3.9 U.S. Department of Agriculture

The U.S. Department of Agriculture (USDA) administers several programs through its Natural Resource Conservation Service (NRCS) that protect and restore shorelines, including the Wetlands Protection Program, the Resource Conservation and Development Program, the Wildlife Habitat Incentives Program, and the Conservation Reserve Program, among several others.

3.10 U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) administers a number of programs that restore and protect other shoreline and aquatic habitats. The Partners for Fish and Wildlife Program helps private landowners restore wetlands and other habitats on their properties through voluntary cooperative agreements. The Water Management and Evaluation Program coordinates and manages issues that affect instream flows and shorelines.

3.11 Washington State

The state of Washington's Governor's Office coordinates restoration efforts with state agencies under the legislation of the Salmon Recovery Planning Act and the Salmon Recovery Funding Act. The lead entity in the Yakima Basin is the Yakima River Basin Fish and Wildlife Recovery Board. The board establishes funding for local habitat restoration projects. In addition, Washington State administers the RCO, as discussed in Section 3.2.

3.12 Washington State Conservation Commission

The Washington State Conservation Commission (WSCC) provides incentives to restore and improve salmon and steelhead habitat on private land under its Conservation Reserve Enhancement Program.

3.13 Washington State Department of Ecology

Ecology works with local jurisdictions, agricultural interests and others to develop clean-up plans, or Total Maximum Daily Loads (TMDLs) for waterbodies, which contain pollutants that exceed state water quality criteria. Currently, the Lower Yakima River has EPA-approved TMDLs for the pesticide DDT, as well as for suspended sediment. Ecology provides water quality monitoring grants and administers the Watershed Planning Act, which supplies grants to local groups to produce watershed plans.

3.14 Washington State Department of Fish and Wildlife

WDFW has close involvement in both the technical and policy aspects of fisheries research and habitat restoration in the Lower Yakima River.

3.15 Washington State Department of Natural Resources

The Washington State Department of Natural Resources (DNR) restores freshwater and marine habitat under its Aquatic Lands Enhancement Account Grant Program.

3.16 Yakama Nation

The Yakama Nation, also known as the Confederated Tribes and Bands of the Yakama Indian Nation, is a fish and wildlife co-manager of the Yakima Subbasin. The Yakama Nation works for the protection and enhancement of treaty fish, wildlife, and habitats for present and future generations.

4 RESTORATION CONTEXT, GOALS, AND PRIORITIES

Shoreline restoration is a response to habitat impairment that has occurred as a result of alterations to the hydrology and physical structure of the shore. To plan restoration, there must be an understanding of the major existing impairments, an overarching set of goals to guide the work, a prioritization context to organize the efforts, and a list of the available opportunities.

4.1 Shoreline Impairments

The ecosystem-wide processes and structure of City shorelines were described in detail in the SIAC Report for Richland (Section 5; Anchor QEA 2013). In addition, the alterations to these processes were discussed in terms of how the processes are interrupted or curtailed within the County, and how physical and biological functions of habitat are affected.

Table 1 provides a summary of the major City of Richland shoreline processes, alterations, and impairments. As shown in Table 1, alterations have occurred and impact shoreline processes involving hydrology, sediment, water quality, and habitat. These alterations include Columbia and Yakima Basin water storage and conveyance, impervious surfaces, vegetation alterations, water quality impacts, structural effects on habitat, shoreline hardening/stabilization, channel realignment, and other alterations such as lighting, noise, recreation, and species competition.

Table 1
Ecological Processes and Structures Affected by Major Alterations

			Ecological Processes & Structure																	
			Hydrology					Sediment		Water Quality			Habitat							
		Physical & Biological Functions	Storage	Subsurface Infiltration and flow	Surface flows	Hyporheic Exchange	Groundwater Recharge	Soil Erosion	Deposition/Storage	Nutrient Sources	Temperature/Dissolved Oxygen	Toxins/Pathogen sources	Riparian Vegetation Recruitment	Native grasslands and shrub steppe	Terrestrial Species - Foraging	Terrestrial Species - Breeding/Nestin	Terrestrial Species - Migration	Aquatic Species - Spawning	Aquatic Species - Rearing	Aquatic Species - Migration
Major Alterations	**Impairments**																			
Yakima and Columbia Basin Project(s) Storage	Restricts water movement		x		x						x	x						x	x	x
	Restricts sediment movement							x	x	x										
	New lakes and wetlands						x							x	x	x	x	x	x	x
	More rapid pool elevation fluctuations					x		x					x					x	x	x
Yakima and Columbia Basin Project Diversion/Conveyance	New or relocated channels and wetlands						x							x	x	x	x	x	x	x
	New recharge areas						x													
	Water velocity increases							x	x			x								
Impervious Surfaces	Run-off rather than infiltration		x	x	x			x			x	x						x	x	
	Stormwater management/infrastructure		x	x			x			x		x								
	Habitat loss												x	x	x	x	x			
Vegetation Alterations	Loss of nutrient and organic inputs, reduced evapotranspiration and bioinfiltration, increased toxin and nutrient loading									x	x	x	x	x						
	Invasive species (terrestrial and aquatic)												x	x				x	x	
	Aquatic species															x	x		x	x
	Increased soil erosion							x					x		x					
Water Quality Impacts	Fertilizer/pesticide/herbicide Inputs											x								
	Effluent inputs											x								
	Temperature increases										x									
	Bioaccumulation of toxins														x	x				
Structural Effects on Habitat	Habitat fragmentation by roads												x	x	x	x	x			
	Over-water structures alter sediment, organic material pathways and the photic zone				x													x	x	x
	Aquatic fill, reduced water storage																	x		
Shoreline Hardening/Stabilization	Habitat loss, replacement of variable sized material with large homogenous substrate												x		x	x	x	x	x	x
	Increased wave energy at toe of slope and energy transfer downstream/down current of hardening							x	x											
	Sediment and subsurface water cycle disruption					x			x											
	Organic material cycle disruption									x										
Channel Realignment	Water velocity increases				x				x									x	x	x
	Reduced floodplain connection and functions					x														
	Decreased temporary storage of sediment, nutrient-, toxin-, or pathogen-laden water in streams								x	x		x								
Other Alterations	Artificial lighting increases light delivery at unnatural times														x	x	x	x	x	x
	Increased noise														x	x	x			
	Recreation infrastructure increases wave energy at shoreline (boat ramps, wakes)							x	x									x	x	x
	Non-native species predation														x	x	x	x	x	x
	Competition for resources from non-native species												x	x	x	x	x	x	x	x

4.2 Restoration Goals and Objectives

As described in Section 3, much work has been done with regard to setting the direction for habitat management and restoration planning in the Richland area. The general management goals identified in the plans for these areas were used to formulate a list of goals and example objectives for this Restoration Plan. These goals and objectives, as follows, will guide the restoration actions described herein and can be used to formulate metrics to monitor progress in implementing the Plan.

1. Protect, maintain, and where feasible, enhance or restore riparian, shrub-steppe, wetland, and floodplain areas within SMP jurisdiction. Example objectives could include removing or managing invasive vegetation and re-planting natives, and consolidating recreation access away from sensitive habitats.
2. Promote and enhance habitat diversity, especially for sensitive or rare areas (e.g., shrub-steppe, riparian zones). Example objectives could include incorporating habitat complexity and vegetative components into soft bank stabilization techniques, or re-connecting off-channel habitat.
3. Protect and maintain water quality, which contributes to the recovery of sensitive species and improves impaired temperatures and contaminant conditions. Example objectives could include implementing Best Management Practices for soil erosion and for applying pesticides, herbicides, and fertilizers in irrigated areas; and reducing unnecessary impervious surface area.

4.3 Restoration Opportunities

Several opportunities now exist for restoration of Richland shorelines, presented below by reach and by specific projects or sites.

4.3.1 General Restoration Opportunities

Various ecological benefits can be realized if shoreline impairments are addressed by restoration in Richland. Opportunities can be identified and compared against various criteria to prioritize implementation. The habitat plans and programs described in Section 3 of this document describe direction and/or recommendations for actions to address many of the impairments that occur within the City. Table 2 shows the restoration or protection

opportunities that these plans and programs have identified, including the reasons for the habitat impairment and a summary of the ecological benefits to be realized from the actions. The SIAC (Anchor QEA 2013) also recommended actions for specific areas within City SMP boundaries, shown in Table 2 by reach and sub-reach (see SIAC report for reach extents).

Major opportunities identified include establishing or protecting sensitive habitats such as riparian, wetland, off-channel, and shrub-steppe habitats. This could be accomplished by consolidating or restricting access to these areas by livestock and recreationists. Former or degraded wetland and off-channel habitats could be reconnected to the Yakima River. WDFW has recommended specific measures for shrub-steppe habitat restoration (WDFW 2011a) and has given direction for managing these habitats in developed areas (WDFW 2011b). Protecting or improving water quality was also a key element of habitat management under these plans, particularly water temperature. Examples of measures that could be used to improve or protect water quality include implementing the most recent state stormwater controls, as well as using best management practices for soil erosion and control of pesticides, herbicides and fertilizers to irrigated areas in more rural areas within the City.

Table 2

Restoration and Protection Opportunities and Priorities[1] in Richland

	Restoration / Protection Opportunities	Key Impairments[2]	Key Benefits to Ecological Functions[2]	Richland (All Reaches)	Reach 1	Reach 2	Reach 3A	Reach 3B	Reach 3C	Reach 4A	Reach 4B	Reach 4C	Reach 5	Reach 6A	Reach 6B	Reach 6C	Reach 7A	Reach 7B	Reach 7C	Reach 7D
1	Establish riparian buffers where absent and/or remove invasives where present	Loss of nutrient and organic inputs, reduced evapotranspiration and bioinfiltration	Riparian vegetation recruitment Temperature/dissolved oxygen improvements Improve toxin/pathogen management capabilities Increased habitat for aquatic and terrestrial species foraging/breeding/nesting/migration	*ALYRBC CBOP YSBP YSRP*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	
2	Restore/enhance shrub-steppe along shorelines	Habitat loss - shrub-steppe	Increased native shrub-steppe habitat for terrestrial species foraging/breeding/nesting/migration					*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*								
3	Protect intact shrub-steppe habitat	NA	Increased native shrub-steppe habitat for terrestrial species foraging/breeding/nesting/migration	***IWRMP***					***SIAC***	***SIAC***	***SIAC***	***SIAC***	***SIAC***	***SIAC***			***SIAC***	***SIAC***	***SIAC***	***SIAC***
4	Reconnect floodplain and/or wetland connectivity, evaluate opportunities for additional side channels and off-channel rearing habitat	Habitat fragmentation Reduced water storage, and reduced filtration of sediment, nutrient-, toxin-, or pathogen-laden water Habitat loss Sediment and organic material cycle disruption	Increased water storage Increased subsurface infiltration and flow, protect surface water quality Increased hyporheic exchange and groundwater recharge Increased habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing	**CBOP IWRMP YSBP**				**SIAC**		**SIAC**										
5	Protect existing riparian, wetland, and floodplain habitats	NA	Protections for temperature/dissolved oxygen conditions and protection against toxin/pathogen addition Protections for aquatic and terrestrial species - foraging/greeding/nesting/rearing	***CBOP YSBP YSRP***	***SIAC***		***SIAC***	***SIAC***	***SIAC***	***SIAC***	***SIAC***	***SIAC***	***SIAC***	***SIAC***			***SIAC***	***SIAC***	***SIAC***	***SIAC***
6	Add grass or woody plant strips between agricultural fields and either lakes or streams	Habitat loss	Soil erosion protection Increased habitat for terrestrial species - foraging/breeding/nesting/migration				*SIAC*													
7	Manage built environment encroachment or recreation use to minimize disturbance to shoreline vegetation and aquatic habitat	Habitat loss	Riparian vegetation recruitment for native terrestrial species foraging/breeding/nesting habitat Temperature/dissolved oxygen improvements Improved toxin/pathogen management capabilities			*SIAC*			*SIAC*		*SIAC*		*SIAC*		*SIAC*	*SIAC*				
8	Reduce unnecessary impervious surface area	Run-off rather than infiltration Requires more built environment to manage (tormwater management/infrastructure) Habitat loss	Increased infiltration and groundwater recharge Protections for surface water quality Increased native terrestrial species foraging/breeding/nesting habitat																*SIAC*	
9	Implement soil erosion BMPs to reduce sediment inputs to drain network	Sediment cycle disruption	Increased subsurface infiltration and flow, protections for surface water quality Reductions in soil erosion	**YSBP**																
10	Use Best Management Practices for landscape irrigated areas (application rates for pesticides, herbicides, and fertilizers).	Fertilizer/Pesticide/Herbicide Inputs Effluent Inputs Temperature increases Bioaccumulation of toxins	Improved temperature/dissolved oxygen and protect against toxin and pathogen sources													**SIAC**				

Table 2

Restoration and Protection Opportunities and Priorities[1] in Richland

Restoration / Protection Opportunities		Key Impairments[2]	Key Benefits to Ecological Functions[2]	Richland (All Reaches)	Reach 1	Reach 2	Reach 3A	Reach 3B	Reach 3C	Reach 4A	Reach 4B	Reach 4C	Reach 5	Reach 6A	Reach 6B	Reach 6C	Reach 7A	Reach 7B	Reach 7C	Reach 7D
11	Evaluate appropriate shoreline solutions to support channel migration or delta natural processes	Increased water velocity	Improved surface flow velocity and hyporheic exchange																	
		Reduced floodplain connection and functions and habitat fragmentation	Improved habitat for aquatic species - rearing/migration				**SIAC**							**SIAC**		**SIAC**				
		Sediment and surface water cycle disruption	Improved habitat connectivity and sediment delivery processes																	
12	Incorporate soft shore stabilization where appropriate	Habitat loss along shoreline	Maintained or increased habitat for aquatic species – rearing/migration																	
		Increased wave energy due to shoreline armoring	Reduced soil erosion																	

Notes:

1 Priority categories are Very High (habitat protection actions) - shown in ***bold italics*** , High (actions that restore ecosystem function) shown in **bold,** and Moderate (actions that restore habitat structure) shown in *italics.*

2 Impairment and benefits general categories come from Table 1 of this Restoration Plan

ALYRBC - Assessment of the Lower Yakima River in Benton County, Washington

CBOP - Interim Comprehensive Basin Operating Plan for the Yakima Project

SIAC – Shoreline Inventory, Analysis, and Characterization Report (Anchor QEA)

IWRMP - Yakima River Basin Integrated Water Resource Management Plan

YSBP - Yakima Subbasin Plan

YSRP - Yakima Steelhead Recovery Plan

NA - Not applicable because this is a habitat protection action.

Table 2

Restoration and Protection Opportunities and Priorities[1] in Richland

	Restoration / Protection Opportunities	Key Impairments[2]	Key Benefits to Ecological Functions[2]	Reach 8A	Reach 8B	Reach 8C	Reach 8D	Reach 8E	Reach 8F	Reach 9A	Reach 9B	Reach 9C	Reach 9D	Reach 9E	Reach 10A	Reach 10B	Reach 10C
1	Establish riparian buffers where absent and/or remove invasives where present	Loss of nutrient and organic inputs, reduced evapotranspiration and bioinfiltration	Riparian vegetation recruitment Temperature/dissolved oxygen improvements Improve toxin/pathogen management capabilities Increased habitat for aquatic and terrestrial species foraging/breeding/nesting/migration	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*		*SIAC*	*SIAC*	*SIAC*	*SIAC*		*SIAC*	*SIAC*	*SIAC*
2	Restore/enhance shrub-steppe along shorelines	Habitat loss - shrub-steppe	Increased native shrub-steppe habitat for terrestrial species foraging/breeding/nesting/migration	*SIAC*	*SIAC*	*SIAC*	*SIAC*			*SIAC*							
3	Protect intact shrub-steppe habitat	NA	Increased native shrub-steppe habitat for terrestrial species foraging/breeding/nesting/migration	***SIAC***													
4	Reconnect floodplain and/or wetland connectivity, evaluate opportunities for additional side channels and off-channel rearing habitat	Habitat fragmentation Reduced water storage, and reduced filtration of sediment, nutrient-, toxin-, or pathogen-laden water Habitat loss Sediment and organic material cycle disruption	Increased water storage Increased subsurface infiltration and flow, protect surface water quality Increased hyporheic exchange and groundwater recharge Increased habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing														
5	Protect existing riparian, wetland, and floodplain habitats	NA	Protections for temperature/dissolved oxygen conditions and protection against toxin/pathogen addition Protections for aquatic and terrestrial species - foraging/greeding/nesting/rearing				***SIAC***	***SIAC***			***SIAD***	***SIAC***	***SIAC***			***SIAC***	***SIAC***
6	Add grass or woody plant strips between agricultural fields and either lakes or streams	Habitat loss	Soil erosion protection Increased habitat for terrestrial species - foraging/breeding/nesting/migration														
7	Manage built environment encroachment or recreation use to minimize disturbance to shoreline vegetation and aquatic habitat	Habitat loss	Riparian vegetation recruitment for native terrestrial species foraging/breeding/nesting habitat Temperature/dissolved oxygen improvements Improved toxin/pathogen management capabilities	*SIAC*		*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*	*SIAC*
8	Reduce unnecessary impervious surface area	Run-off rather than infiltration Requires more built environment to manage (tormwater management/infrastructure) Habitat loss	Increased infiltration and groundwater recharge Protections for surface water quality Increased native terrestrial species foraging/breeding/nesting habitat														
9	Implement soil erosion BMPs to reduce sediment inputs to drain network	Sediment cycle disruption	Increased subsurface infiltration and flow, protections for surface water quality Reductions in soil erosion														
10	Use Best Management Practices for landscape irrigated areas (application rates for pesticides, herbicides, and fertilizers).	Fertilizer/Pesticide/Herbicide Inputs Effluent Inputs Temperature increases Bioaccumulation of toxins	Improved temperature/dissolved oxygen and protect against toxin and pathogen sources				**SIAC**				**SIAC**	**SIAC**	**SIAC**		**SIAC**	**SIAC**	**SIAC**

Table 2

Restoration and Protection Opportunities and Priorities[1] in Richland

Restoration / Protection Opportunities		Key Impairments[2]	Key Benefits to Ecological Functions[2]	Reach 8A	Reach 8B	Reach 8C	Reach 8D	Reach 8E	Reach 8F	Reach 9A	Reach 9B	Reach 9C	Reach 9D	Reach 9E	Reach 10A	Reach 10B	Reach 10C
11	Evaluate appropriate shoreline solutions to support channel migration or delta natural processes	Increased water velocity	Improved surface flow velocity and hyporheic exchange														
		Reduced floodplain connection and functions and habitat fragmentation	Improved habitat for aquatic species - rearing/migration														
		Sediment and surface water cycle disruption	Improved habitat connectivity and sediment delivery processes														
12	Incorporate soft shore stabilization where appropriate	Habitat loss along shoreline	Maintained or increased habitat for aquatic species – rearing/migration	*SIAC*			*SIAC*								*SIAC*	*SIAC*	*SIAC*
		Increased wave energy due to shoreline armoring	Reduced soil erosion														

Notes:

1 Priority categories are Very High (habitat protection actions) - shown in ***bold italics*** , High (actions that restore ecosystem function) shown in **bold,** and Moderate (actions that restore habitat structure) shown in *italics.*

2 Impairment and benefits general categories come from Table 1 of this Restoration Plan

ALYRBC - Assessment of the Lower Yakima River in Benton County, Washington

CBOP - Interim Comprehensive Basin Operating Plan for the Yakima Project

SIAC – Shoreline Inventory, Analysis, and Characterization Report (Anchor QEA)

IWRMP - Yakima River Basin Integrated Water Resource Management Plan

YSBP - Yakima Subbasin Plan

YSRP - Yakima Steelhead Recovery Plan

NA - Not applicable because this is a habitat protection action.

4.3.2 Site-specific Restoration and Protection Opportunities

While most plans and programs from the SMP jurisdictional area address large-scale direction and management, there is a small set of actions that are named or have been suggested for specific areas. Table 3 lists these locations and opportunities, and includes the source document, as well as the impairment to be addressed and the key benefits to ecological function expected as a result of the project implementation.

Table 3
Site-specific Restoration and Protection Opportunities in Richland

	Site	Restoration/Protection Opportunities	Priority[1]	Source	Key Impairments[2]	Key Benefits to Ecological Functions[2]
1	**Bateman Island**	Coordinate low-intensity recreation use management to concentrate riparian, shoreline, and shallow aquatic impacts	Moderate	SMP public visioning workshop 1/23/13	Habitat loss - riparian and wetland	Riparian vegetation recruitment for native terrestrial species foraging/breeding/nesting habitat Protections for temperature/dissolved oxygen conditions and protection against toxin/pathogen addition Reductions in soil erosion
		Remove invasives and replace with native vegetation[3]	Moderate	SIAC, SVMP	Habitat loss	Increased native shrub-steppe habitat for terrestrial species - foraging/breeding/nesting/migration Riparian vegetation recruitment
		Evaluate options for breaching causeway for protection of Bateman Island and reconnection of Yakima River flow	Very High	SIAC	Habitat loss and fragmentation Restricts water movement	Habitat protection for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing Improved habitat connectivity and sediment delivery processes
2	**Columbia Point South Trail System**	Coordinate low-intensity recreation use management to concentrate riparian, shoreline, and shallow aquatic impacts	Moderate	SMP public visioning workshop 1/23/13	Habitat loss - riparian and wetland	Riparian vegetation recruitment for native terrestrial species -foraging/breeding/nesting habitat Protections for temperature/dissolved oxygen conditions and protection against toxin/pathogen addition Reductions in soil erosion
3	**Marina Vista Estates**	Enhance riparian zone along shoreline	Moderate	SMP public visioning workshop 1/23/13	Habitat loss	Increased native shrub-steppe habitat for terrestrial species - foraging/breeding/nesting/migration Riparian vegetation recruitment
4	**East City Limits to West Side of Columbia Park West**	Set back road from current location; enhance riparian zone along shoreline by removing concrete rubble and retaining wall (replace with boulders), and removing Russian Olive, where reasonably practicable, and other invasive species, and replacing with native riparian vegetation[3]	High	CPWMP; SIAC; SVMP	Habitat loss Sediment and organic material cycle disruption	Increased habitat for terrestrial species - foraging/breeding/nesting/migration Riparian vegetation recruitment Increased native shrub-steppe habitat for terrestrial species - foraging/breeding/nesting/migration
5	**West Side of Columbia Park West to Wye Boat Launch**	Remove, where reasonably practicable, or manage (trim or thin) Russian Olive to enhance foraging habitat for birds, and replace with native riparian vegetation[3]	High	SVMP	Habitat loss	Increased native shrub-steppe habitat for terrestrial species - foraging/breeding/nesting/migration Riparian vegetation recruitment
6	**Wye Boat Launch to SR 240 (Wye Levee)**	Bank stabilization using soft-engineering techniques that also increase habitat functions. Remove Russian Olive, where reasonably practicable, and other invasive species, and replace with native riaparian vegetation[3]	High	SVMP	Habitat loss	Increased native riparian habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing Riparian vegetation recruitment
7	**Columbia Point South to I-182 Bridge**	Remove, where reasonably practicable, or manage (trim or thin) Russian Olive to enhance foraging habitat for birds, and replace with native vegetation[3]	High	SVMP	Habitat loss	Increased native riparian habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing Riparian vegetation recruitment
8	**I-182 Bridge to Bradley Landing**	Remove, where reasonably practicable, or manage (trim or thin) Russian Olive to enhance foraging habitat for birds, and remove other invasive species, and replace with native riparian vegetation[3]	High	SVMP	Habitat loss	Increased native riparian habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing Riparian vegetation recruitment
9	**Bradley Blvd parking lot to South end of Howard Amon Park**	Bank stabilization using soft-engineering techniques that also increase habitat functions. Remove Russian Olive, where reasonably practicable, and other invasive species, and replace with native upland and riparian vegetation[3]	High	SVMP	Habitat loss	Increased native riparian habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing Riparian vegetation recruitment
10	**Howard Amon Park**	Bank stabilization from boat launch to north end of park using soft-engineering techniques that also increase habitat functions. Remove aged, diseased, and safely hazard trees over time and replace with native trees[3]	High	SVMP	Habitat loss	Increased native riparian habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing Riparian vegetation recruitment
11	**North end of Haines Street levee to sand volleyball courts in Leslie Groves Park**	Remove, where reasonably practicable, or manage (trim or thin) Russian Olive to enhance foraging habitat for birds, and remove other invasive species, and replace with native riparian and upland vegetation[3]	Med	SVMP	Habitat loss	Increased native riparian habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing Riparian vegetation recruitment
12	**Sand volleyball courts in Leslie Groves Park to Snyder Street**	Remove, where reasonably practicable, or manage (trim or thin) Russian Olive to enhance foraging habitat for birds, and remove other invasive species, and replace with native riaprian and upland vegetation[3]	High	SVMP	Habitat loss	Increased native riparian habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing Riparian vegetation recruitment

Table 3
Site-specific Restoration and Protection Opportunities in Richland

	Site	Restoration/Protection Opportunities	Priority[1]	Source	Key Impairments[2]	Key Benefits to Ecological Functions[2]
13	**Snyder Street to Ferry Street**	Remove, where reasonably practicable, or manage (trim or thin) Russian Olive to enhance foraging habitat for birds, and remove invasive species, and replace with native riparian and upland vegetation[3]	High	SVMP	Habitat loss	Increased native riparian habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing Riparian vegetation recruitment
14	**Gravel mining area South of I-182 and west of SR240 along Carrier Rd**	Enhance wetland habitat and riparian buffers	Moderate	SMP public visioning workshop 2/13/13; also SIAC	Reduced water storage, and reduced filtration of sediment, nutrient-, toxin-, or pathogen-laden water Habitat loss	Increased subsurface infiltration and flow, protect surface water quality Increased riparian vegetation recruitment and habitat for terrestrial and aquatic species - foraging/breeding/nesting/migration/rearing
15	**Columbia River parks (all, particularly north of Howard Amon Park)**	Enhance riparian zone along shoreline in areas not frequently used	Moderate	SMP public visioning workshop 2/13/13	Habitat loss	Increased native shrub-steppe habitat for terrestrial species - foraging/breeding/nesting/migration Riparian vegetation recruitment
16	**South end of Riverside drive along irrigation canal**	Enhance riparian and upland habitat along shoreline slope near canal	Moderate	SIAC	Habitat loss	Increased native shrub-steppe habitat for terrestrial species - foraging/breeding/nesting/migration Riparian vegetation recruitment
17	**Irrigation canal parallelling Columbia Park Trail**	Enhance riparian and upland habitat along shoreline slope near canal	Moderate	SIAC	Habitat loss	Increased native shrub-steppe habitat for terrestrial species - foraging/breeding/nesting/migration Riparian vegetation recruitment

Table Notes:

1 Categories are Very High (habitat protection actions), High (actions that restore ecosystem function), and Moderate (actions that restore habitat structure). Funded projects would take priority over other projects within each category.

2 Impairment and Benefits categories come from Table 1 of this Restoration Plan

3 Trees: Coyote and peachleaf willow, black cottonwood, choke cherry and Red Osier dogwood. Native plants: Big basin sage, blue elderberry, golden currant, mock orange, rabbitbrush, smooth sumac, wood's rose, basin wild rye, Indian ricegrass, thickspike wheatgrass, needle and thread grass and yarrow

CPWMP = Columbia Park West Master Plan (RPR 2012).

SIAC = Shoreline Inventory, Analysis, and Characterization Report (Anchor QEA)

SMP = Shoreline Management Program

SVMP = Draft City of Richland Shoreline Vegetation Maintenance Plan (Pinard 2013)

4.4 Project Evaluation and Prioritization Criteria

Projects and opportunities in this Plan can be evaluated against various criteria to prioritize implementation. The following list includes a description of criteria that indicate that a project is viewed as implementable under this Plan.

Potential projects should:

- Meet goals and objectives for shoreline restoration (Section 4.2 of this document)
- Maintain consistency with existing plans and programs as described in Section 3 of this document
- Have public support
- Be located on public property or property owned by a willing partner in restoration projects
- Restore ecosystem processes or provide habitat protection (those that restore function by providing habitat structure only would take a lesser priority)
- Improve a rapidly deteriorating habitat condition
- Have high benefit to ecosystem function relative to cost
- Provide riparian, shoreline, or instream habitat for spawning and rearing listed salmonids, or improve conditions in sensitive shrub-steppe systems for state and federally listed native wildlife (a list of wildlife are given in WDFW 2011b; e.g., Greater Sage grouse, burrowing owl, Townsend's ground squirrel)

All specific projects or actions that comprise a project listed in Table 2 exhibit some, if not all, of the above criteria. To prioritize these actions, they were assigned to a category of Very High, High, and Moderate relative to their value in achieving the SMP goal of no net loss for shorelines within Richland SMP jurisdiction (See Table 2). Projects were categorized as follows:

1. Very High: Habitat protection projects or actions
2. High: Restoration of ecosystem functions (funded actions take higher priority within this category
3. Moderate: Restoration of habitat structure (funded actions take higher priority within this category

5 IMPLEMENTATION, MONITORING, AND REVIEW

Implementation of the restoration plan will require close coordination among the City, Ecology, and other organizational partners noted in Section 3 of this Plan.

5.1 Potential Restoration Funding Partners

There are currently no dedicated funding sources beyond the projects already funded, and City Parks and Recreation operations and maintenance funding for the restoration actions presented here. Accordingly, much of the restoration described in this Plan is dependent on grant funding, and the variety of outside funding sources available for restoration work. Funds are distributed through grant-making agencies at the local, state, and federal level; opportunities described below are primarily administered by state and federal agencies. It is expected that funding will be derived from various sources. Sources listed here do not represent an exhaustive list of potential funding opportunities, but are meant to provide an overview of the types of opportunities available. These sources include the following:

- American Sportfishing Association's Fish America Foundation Grants
- Benton Conservation District
- City of Richland Parks and Recreation Department
- Ecology
  - Aquatic Weeds Financial Assistance Program
  - Water Quality Grants, including federal Clean Water Act Section 319 Program
  - Coastal Protection Fund (Terry Hussman) Grant Program
  - Coastal Zone Management Administration/Implementation Awards
  - Yakima Basin Integrated Water Resource Management Plan Implementation Funding
- EPA Region 10: Pacific Northwest
  - The Clean Water State Revolving Fund Program
  - Nonpoint Source Implementation Grant (319) Program
  - Wetland Protection, Restoration, and Stewardship Discretionary Funding
- National Fish and Wildlife Foundation

  - Bring Back the Natives: A Public-Private Partnership for Restoring Populations of Native Aquatic Species
  - Five-Star Restoration Matching Grants Program
  - Marine Debris Prevention and Removal Program
  - Native Plant Conservation Initiative
  - The Migratory Bird Conservancy
- Recreation and Conservation Office of Washington
  - Salmon Recovery Funding Board (SRFB)
  - Aquatic Lands Enhancement Account (ALEA)
  - Estuary and Salmon Restoration Program
  - Family Forest Fish Passage Program
  - Land and Water Conservation Fund
  - Yakima Basin Fish and Wildlife Recovery Board
  - Washington Wildlife Recreation Program
- USFWS
  - Partners for Fish and Wildlife Program
  - National Fish Passage Program
  - Cooperative Endangered Species Conservation Fund
  - North American Wetlands Conservation Act Grants Program
- USBR YRBWEP funding program and Yakima Basin Integrated Water Resource Management Plan implementation funding
- NOAA Restoration Center
  - Community-based Restoration Program (CRP)
  - NOAA CRP 3-Year Partnership Grants
  - NOAA CRP Project Grants
- WDFW
  - ALEA Volunteer Cooperative Projects Program
  - Landowner Incentive Program
- Private foundations, businesses, and other groups administer grant programs that include funding for shoreline habitat and ecosystems, including:

- The Russell Family Foundation
- William C. Kenney Watershed Protection Foundation
- Northwest Fund for the Environment
- Kongsgaard-Goldman Foundation
- The Bullitt Foundation
- The Compton Foundation
- Doris Duke Charitable Foundation
- The Hugh and Jane Ferguson Foundation
- Washington Trout
- Mid-Columbia Fisheries Enhancement Group

5.2 Timelines, Benchmarks, and Monitoring

The City's restoration work as it relates to this Plan should be monitored and evaluated on a set timeline against a suite of benchmarks to determine consistency with the State's SMP policy standard of no net loss of ecological functions. This Plan will be implemented when the SMP is adopted by Ecology, and could be implemented with a suggested timeline as below, depending on funding availability.

Within 10 years of Plan adoption, objectives could include the following:

- Complete all projects identified in the City's vegetation management plan currently under development (see initial list of projects and other details included in Table 3).
- Prioritize, fund, and complete a set number of other restoration projects (two to five).
- Explore and solidify regular funding opportunities for future projects.
- Identify and implement public workshops, webpages, or another forum for periodically updating residents on the City's shoreline restoration efforts.

Quantifiable benchmarks should also be noted over time to track changes in shoreline conditions and to create documentation for no net loss of shoreline function. A mechanism to track this county-wide could be established and funded.

Information that could be tracked and monitored can be sourced from permit information, project applications, and completion reports filed with various jurisdictions. Possible data could include the following:

- Shoreline variances and reasons/nature of variance
- Linear distance of new hard armoring or hard armoring removed, above the Ordinary High Water Mark (OHWM)
- Linear distance of new soft shoreline stabilization
- Linear distance of new or enhanced riparian vegetation or vegetation removals
- Number of new docks and coverage area
- Number of new piles or piles removed
- Cubic yardage and coverage area of fill removed or replaced, below the OHWM.
- Number of new boat ramps or boat ramps removed
- Number of new outfalls or outfalls removed/consolidated
- Wetland acreage existing, restored, and lost
- Increase or decreases in impervious surface area

5.3 SMP Review

The City will be required to conduct periodic SMP updates, which will include an evaluation of the efficacy of the SMP and this Restoration Plan. This review will involve comparing past conditions with existing conditions, and assessing whether the actions, policies, and regulations set since the last SMP update have been valuable in ensuring no net loss. The evaluation will be an opportunity to adjust these measures as applicable for the benefit of future shoreline conditions.

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