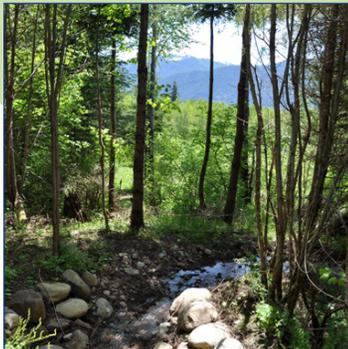


FINAL

Pierce County Parks and Recreation 2014 Parks, Recreation, and Open Space Plan Appendices B-I

Adopted February 2014



Prepared by:

Pierce County Parks and Recreation
BERK Consulting
HBB Landscape Architecture

B. Park & Facility Inventory

Table B-1: PCPR Park and Facility Inventory by Classification ¹

Park	Total Acreage	Outdoor Recreation Amenities										Site Amenities				Park Structures				Other	Comments
		Playgrounds	Paved Courts: Basketball	Paved Courts: Tennis	Soccer Fields	Baseball Fields	Softball Fields	Other Sport Fields	Boat Ramp	Beach (Swimming or Waterfront Access)	Pathways/Trails	Benches	Picnic Tables	Drinking Fountains	Parking Areas	Restrooms	Picnic Shelters	Recreation Center	Caretaker's Residence		
REGIONAL PARKS																					
Spanaway Regional Park																					
Bresemann Forest	65.85										Y										
Lake Spanaway Golf Course	128.80	-	-	-	-	-	-	-	-	-	Y	Y	N	N	Y	2	0	N	Y	Y	
Spanaway Park	88.87	1	2	-	-	1	-	4	1	Y	Y	Y	Y	Y	4	5	N	N	Y		
Sprinker Recreation Center	43.76	1	2	6	7	1	7	1	-	-	Y	Y	Y	Y	Y	1	0	Y	N	Y	
Chambers Creek Regional Park																					
Chambers Bay Golf Course	340.45																				
Chambers Creek Canyon	204.63										Y										
Chambers Creek Canyon - Davis (28.10)																					
Chambers Creek Canyon - Dyer (86.70)																					
Chambers Creek Canyon - Hartley (8.60)																					
Chambers Creek Canyon - Lakewood (43.50)																					
Chambers Creek Canyon Park-Baldwin (1.30)																					
Chambers Creek Canyon (Park) (43.90)																					
Chambers Creek Canyon (WH) (1.30)																					
Chambers Creek Properties	185.00	1						2			Y	Y				1				Y	
Subtotal	1,057.36	3	4	6	7	2	7	7	1	Y-1	Y-5	Y-4	Y-2	Y-2	Y-3	8	5	Y-1	Y-1	Y-4	
REGIONAL/RESOURCE CONSERVANCY PARKS																					
Carbon River Valley	488.34																				
Subtotal	488.34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
COUNTY PARKS																					
Ashford County Park	83.98	1	-	-	-	-	-	-	-	-	Y	Y	Y		Y	1	N	N	N	Y	
Buckley-Bonney Lake Park (Undeveloped)	80.00																				
Cross Park (Undeveloped)	64.03																			Y	
Frontier Park	64.35	1	-	-	-	-	-	-	-	-	Y	Y	Y		Y	2	2	Y	Y	Y	
Heritage Recreation Center	46.90	1	-	-	6	1	4	3	-	-	Y	Y	Y	Y	Y	1	0	N	N	Y	
Meridian Habitat Park	35.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	Y		
North Lake Tapps Park	79.90	-	-	-	-	-	-	-	1	Y	Y	N	Y	Y	Y	2	0	N	Y	Y	
Orangegate Park (Undeveloped)	146.59																				
Rimrock Park (Undeveloped)	139.27																				
Subtotal	740.69	3	0	0	6	1	4	3	1	Y-1	Y-4	Y-3	Y-4	Y-2	Y-4	6	2	Y-2	Y-3	Y-5	

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Park	Total Acreage	Outdoor Recreation Amenities										Site Amenities				Park Structures				Other	Comments
		Playgrounds	Paved Courts: Basketball	Paved Courts: Tennis	Soccer Fields	Baseball Fields	Softball Fields	Other Sport Fields	Boat Ramp	Beach (Swimming or Waterfront Access)	Pathways/Trails	Benches	Picnic Tables	Drinking Fountains	Parking Areas	Restrooms	Picnic Shelters	Recreation Center	Caretaker's Residence		
LOCAL PARKS																					
Dawson Playfield	5.05	1	1.5	2	-	-	1	1	-	-	Y	Y	Y	N	Y	1	1	N	N	-	Football field overlaid on softball field.
Gonyea Playfield	12.42	2	2	-	2	1	4	3	-	-	Y	Y	Y	Y	Y	1	0	N	N	-	Poor accessibility. Unpaved diagonal parking.
Hopp Farm	38.78																				Classified as Local Park instead of Undeveloped (2008 Category).
Lidford Playfield	9.78	-	-	-	-	1	2	-	-	-	N	N	N	N	Y	0	0	N	N	Y	Puyallup maintains this site. No irrigation. Gravel parking. Old storage shed (poor condition).
Mayfair Playfield	4.58	-	-	-	-	-	1	-	-	-	N	N	N	N	Y	0	0	N	N	N	Poor visibility (no street frontages)
South Hill Community Park	39.56	2	-	-	1	-	-	-	-	-	Y	Y	N	N	Y	0	0	N	N	N	Tot/youth play equipment. Grass field is used for youth soccer and football. No irrigation except by playgrounds and wetlands.
Subtotal	110.17	5	3.5	2	3	2	8	4	0	0	Y-3	Y-3	Y-2	Y-1	Y-5	2	1	Y-0	Y-0	Y-1	
SPECIAL USE FACILITIES																					
Fort Steilacoom Golf Course	81.92	-	-	-	1	1	-	-	-	-	Y	N	N	?	Y	1	0	N	N	Y	9 hole course. Pro building. Disc golf on both site and hospital grounds. Soccer field overlaid on baseball field.
Herron Point (Undeveloped)	0.34																				
Lakewood Community Center	3.71	-	-	-	-	-	-	-	-	-	N	N	N	N	Y	0	0	Y	N	N	Dividable gym, Lakewood Senior Center, programmable classroom space, office space, meeting rooms/classrooms, locker rooms, deck.
Purdy Sand Spit ²	63.97	-	-	-	-	-	-	-	1	Y	N	N	N	N	N	0	0	N	N	N	3/4 mile beach along bridge. Used for windsurfing, picnics, small boat launch. Previously classified as Undeveloped (2008 inventory).
Riverside Park	36.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	User maintained disc golf course and BMX track. Site on the Puyallup River is wooded and silty. Used for fishing. Previously categorized as Undeveloped.
Subtotal	186.05	0	0	0	1	1	0	0	1	Y-1	Y-1	Y-0	Y-0	Y-0	Y-2	1	0	Y-1	Y-0	Y-2	
RESOURCE CONSERVANCY PARKS																					
Buckley Forestland Preserve	200.00																				Managed by Forterra.
Devils Head	94.14																				Changed to Resource Conservancy
Fairfax Properties	1,080.00																				Changed to Resource Conservancy
Fairfax Town Site	155.47																				Changed to Reserouce Conservancy
Lake Tapps Habitat	27.20																				Changed to Resource Conservancy
Nisqually River Interpretive Center	68.45																				Changed to Resource Conservancy
Parkland Habitat	4.88	-	-	-	-	-	-	-	-	-	N	N	N	N	N	0	0	N	N	N	Clover Creek crosses back of site. Includes Parkland Prairie addition.
Puget Creek Beach	1.85																				
Seeley Lake Park	45.98	-	-	-	-	-	-	-	-	-	Y	N	Y	?	Y	0	0	N	N	Y	Interpretive shelter. Adjacent to Lakewood Community Center.
South Pierce Wetland	156.40																				
Swan Creek Park (includes Waller Property)	59.98	-	-	-	-	-	-	-	-	-	Y	-	-	-	Y	-	-	-	-	-	Connects to MPT Swan Creek and Waller property (former gravel mine). Formerly classified as Undeveloped (in 2008).
Subtotal	1,894.35	0	0	0	0	0	0	0	0	0	Y-2	Y-0	Y-1	Y-0	Y-2	0	0	Y-0	Y-0	Y-1	
LINEAR PARKS/TRAILS																					
Chapman Trail (Nathan Chapman Memorial Trail)	1.56	-	-	-	-	-	-	-	-	-	Y	N	N	N	N	0	0	N	N		
Foothills Trail	519.86	-	-	-	-	-	-	-	-	-	Y	Y	N	Y	Y	1	-	-	-	Y	Three trailheads with restrooms, trail map kiosks, and parking. (East Puyallup Trailhead, McMillan Trailhead, South Prairie Trailhead). Unofficial parking at South Prairie Creek.
Half Dollar Park (Undeveloped)	2.38																				
Ohop Trail Extension (Undeveloped)	13.67																				
Puyallup River Levee Trail	1.51										Y	Y									County ownership of small segment of Puyallup River trail. Has been paved as part of a Puyallup project. County does not maintain. Changed to Linear Park
Subtotal	538.98	0	0	0	0	0	0	0	0	0	Y-3	Y-2	Y-0	Y-1	Y-1	1	0	Y-0	Y-0	Y-1	
UNCLASSIFIED SITES																					
Milton Freeway Tracts	8.60																				
Wales Property	2.50																				
Subtotal	11.10	0	0	0	0	0	0	0	0	0	Y-0	Y-0	Y-0	Y-0	Y-0	0	0	0	0	0	

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CEMETERIES																					
265 Ave E Cemetery	6.25																				
Lake Tapps Cemetery	1.00																				See RCW citation.
Old Settlers Cemetery	4.24	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	Y	Pioneer cemetery. Mowed 6x per year. Settling around gravestones. See RCW citation.
Roy Cemetery	0.26																				See RCW citation.
Subtotal	11.75	0	0	0	0	0	0	0	0	0	Y-0	Y-0	Y-0	Y-0	Y-0	0	0	Y-0	Y-0	Y-1	
OTHER COUNTY-OWNED PROPERTIES																					
Naches Trail Preserve	49.56										Y										
Subtotal	49.56	0	0	0	0	0	0	0	0	0	Y-1	0	0	0	0	0	0	0	0	0	Public Works & Utilities. Adjacent to Cross Park.
OTHER SITES																					
Subtotal	-	0	0	0	0	0	0	0	0	0	Y-0	Y-0	Y-0	Y-0	Y-0	0	0	Y-0	Y-0	Y-0	
TOTAL (PCPR Parks Only)	5,038.79	11	8	8	17	6	19	14	3	Y-3	Y-18	Y-12	Y-9	Y-6	Y-17	18	8	Y-3	Y-4	Y-15	
TOTAL (All Parks)	5,088.35	11	7.5	8	17	6	19	14	3	Y-3	Y-19	Y-12	Y-9	Y-6	Y-17	18	8	Y-3	Y-4	Y-15	

¹ The inventory reflects current information for the PCPR park system as of March 2013.

² The boat ramp at the Purdy Sand Spit is managed by Public Works.

Note: Y = Yes, this amenity is present at the park. N = No, the amenity is not present. For subtotals and totals, Y=# indicates the number of sites where this amenity is present. It does not indicate how many of these items are present in PCPR parks.

C. Habitat Element Inventory

APPENDIX C. HABITAT ELEMENT INVENTORY

Pierce County Parks, Recreation, and Open Space (PROS) Plan

INTRODUCTION

This document includes an inventory of habitat types and current programs that assist in the protection, enhancement, or restoration of habitat in Pierce County. It supports the Habitat Component of the Parks, Recreation, and Open Space (PROS) Plan.

Overview

Pierce County contains 1,800 square miles of territory including marine waters. The County's 1,670 square miles of land extend from Puget Sound marine shorelines, through river valleys, to the Cascade Range, including Mount Rainier at 14,410 feet, the highest natural point in Washington State (ESD 2012). The glaciers of Mount Rainier feed large rivers (NPS 2013) including the Puyallup, Carbon, White and Nisqually Rivers. Mountains and foothills support forests, including forests managed for commercial harvest. Oak and prairie lands, wetlands, streams, lakes, agricultural lands are found in Pierce County valleys and plains.

Pierce County lies in two ecoregions – areas of broad ecological patterns that have been mapped for the Pacific Northwest:

- The **Puget Trough Ecoregion** in the western portion of the county below 1,000 feet in elevation contains deepwater and nearshore marine habitats, riparian habitats, oak woodlands, and prairies and other habitats. Puget Sound is considered a globally important estuary. (LandScope Washington 2008)
- The **West Cascades Ecoregion** in the eastern portion of the county above 1,000 feet contains natural and semi-natural conifer forests and in some locations alpine meadows and heath fields. Mount Rainier is “home to 890 vascular plants, amounting to 30% of the flora found in Washington” (LandScope Washington 2008).

Habitats

Habitats – environments where plants, fish, and wildlife normally live and grow – vary in the county:

- **Marine:** There are 179 linear miles of marine shorelines in unincorporated county jurisdiction (ESA 2007). Based on a nearshore habitat assessment of unincorporated shorelines, there are about 2,378 acres of marine shoreline critical salmon habitat (See Table 1).¹ Marine habitats and shoreforms along county shorelines include feeder bluffs, gravel/cobble beaches, sand and mud flats, large and small estuaries, lagoons, and large and small bays. Marine habitats support marine mammals (e.g. harbor seal), fish (e.g. salmon), seabirds (e.g. loons), and invertebrates (e.g. clams, oysters, and geoduck) (WDFW 2008). Important plant species include eelgrass and kelp. See also the discussion of the Puget Sound Nearshore below.

¹ According to the description of this data by Pierce County GIS, the information includes parcels that are considered within a 100 foot buffered area of “high quality salmon habitat shoreline areas,” and used the Nearshore Salmon Habitat-Assessment which is considered “Best Science Available” for Unincorporated Pierce County.

- **Estuarine Habitats:** Estuaries are transition areas where freshwaters meets marine waters such as at the confluence of a river and the Puget Sound or seeps providing inputs into bays. Pocket estuaries are associated with smaller bays and streams. Estuarine habitats can support a variety of mammals, fish, seabirds, and invertebrates noted for marine habitats, but are particularly important for the feeding, refuge, and migration of juvenile salmonids (ESA 2007). A highly important estuarine habitat supporting a wide variety of priority and special status plant and animal species is the Nisqually River Delta since it has not been heavily altered with urban growth and development (ESA 2007). See also the discussion of the Puget Sound Nearshore below.
- **Freshwater Habitats:** Freshwater habitats include wetlands, streams, and lakes. Major lakes include Alder Lake, American Lake, and Lake Tapps among others. Within unincorporated county territory, excluding state and federal lands, streams extend 734 miles and wetlands cover about 36,450 acres (See Table 1). Freshwater habitats support fish, amphibians, birds, and mammals.
- **Terrestrial Habitats:** Terrestrial habitats include forests and grasslands. Washington has one native oak species, the Garry oak, which is found on 1,616 acres of unincorporated land excluding state and federal lands; however, 47% of the Garry oak in unincorporated territory is mapped in unincorporated urban growth areas (UGAs) where urban growth is likely to occur (See Table 1). Garry oak is often associated with grasslands. The county contains prairies considered priority habitats, and areas that are valuable ecologically and culturally, supporting rare and threatened species (Noland and Carver, 2011).

Table 1. Summary of Selected Marine, Freshwater, and Terrestrial Habitats in Pierce County

Subarea	Marine Shoreline	Wetlands	Streams	Oak Presence
	Critical Salmon Habitat			
	Acres	Acres	Miles	Acres
Incorporated City	Not studied	1,754	72	1,823
Unincorporated UGA	103	2,971	32	760
Joint Base Lewis McChord	0*	258	39	37
Rural Total	2,275	33,899	1,338	864
Rural Unincorporated, General	2,197	33,479	702	855
Mount Rainier National Park	0	0*	351	0
Other State, Federal Lands	78	420	285	8
Total	2,378	38,882	1,480	3,484

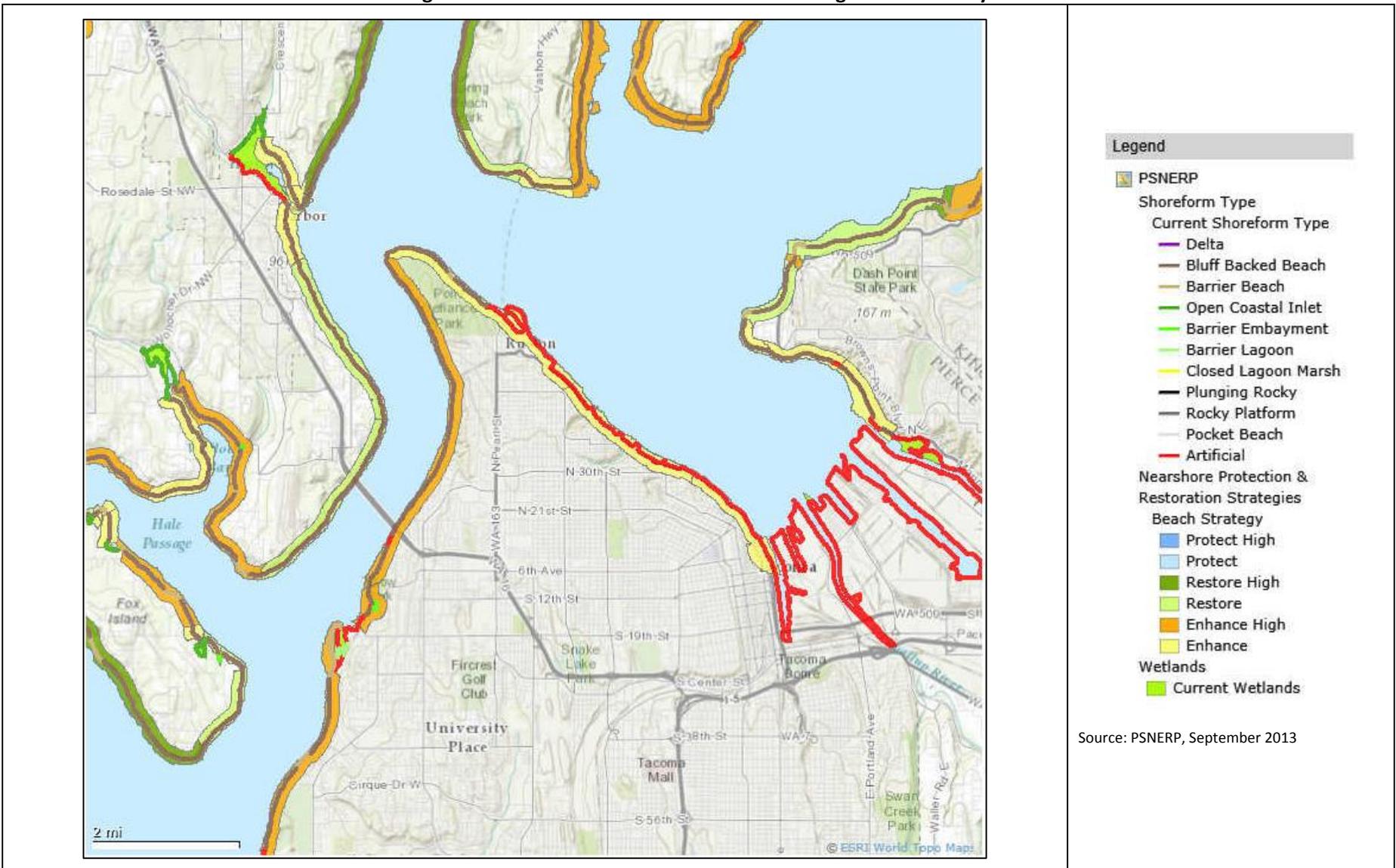
Note: * These habitats are likely present but not included in GIS mapping.

Source: Pierce County GIS; BERK 2013

Puget Sound Nearshore Conditions

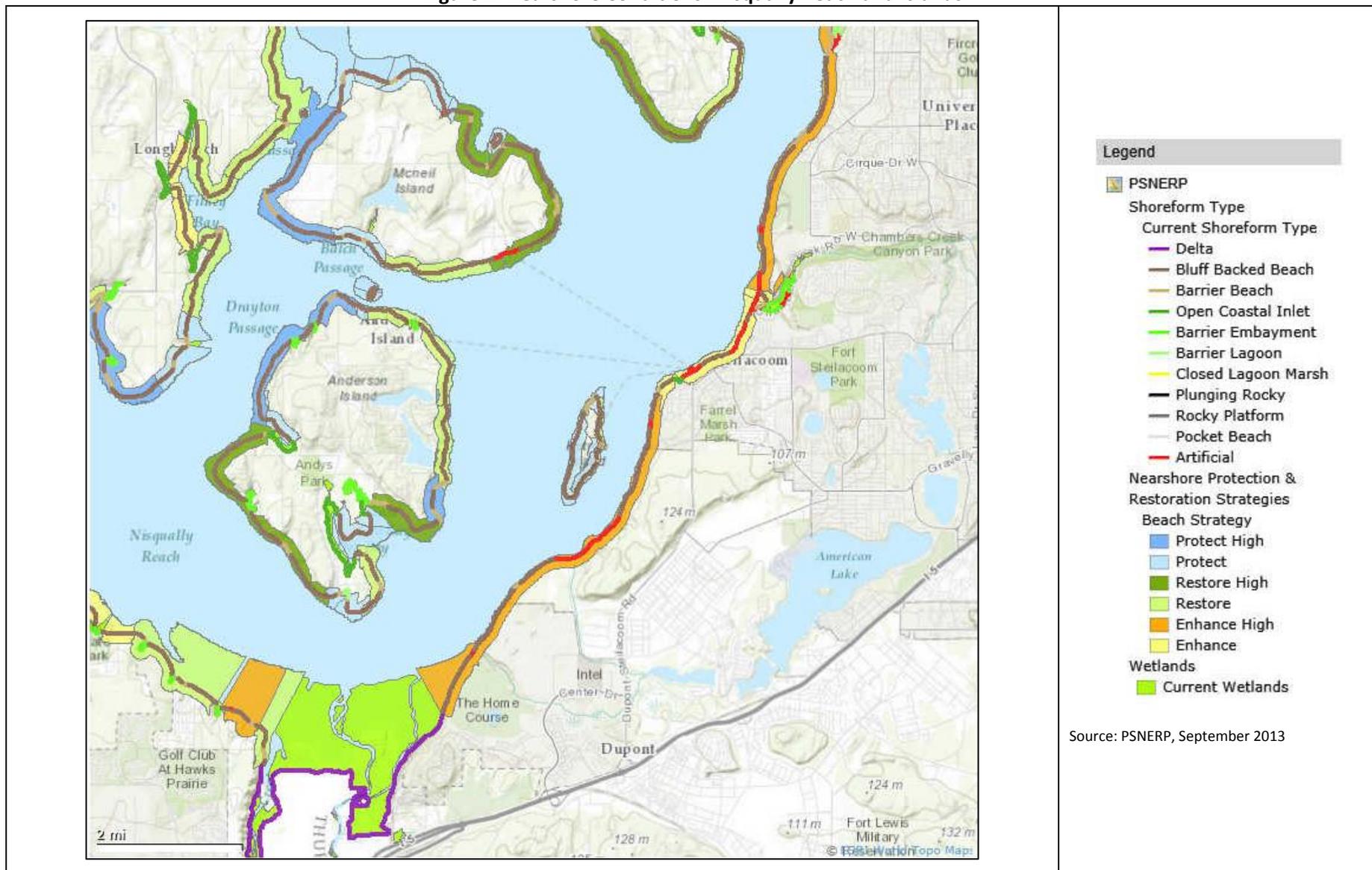
Puget Sound has over 2,500 miles of shoreline, and as noted above, Pierce County’s Shoreline Master Program estimated that there are 179 miles of shoreline that are in unincorporated territory. The nearshore includes drift cells (movement of sediment along the shore by waves and tides) and adjacent upland areas. The nearshore contains important aquatic and upland habitats that have been and could be affected by physical changes that degrade the ecosystem. Conditions vary along Pierce County’s marine shorelines with artificial shoreforms particularly in the Port of Tacoma vicinity and natural shoreforms such as bluffs, beaches, lagoons, deltas, and others elsewhere. The Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) has identified both the shoreforms and protection and restoration strategies. Figure 1, Figure 2, and Figure 3 below indicate the shoreforms and strategies for Pierce County’s nearshore. Areas identified as high priority for restoration are along Kitsap Peninsula north of Gig Harbor, and parts of Key Peninsula, Fox Island, Anderson Island, and McNeil Island. Areas identified as a high priority for enhancement include the marine shoreline from Point Defiance to the Nisqually Delta. Areas identified as high priorities for protection include parts of Key Peninsula, Fox Island, and Anderson Island.

Figure 1. Nearshore Conditions: Tacoma and Gig Harbor Vicinity



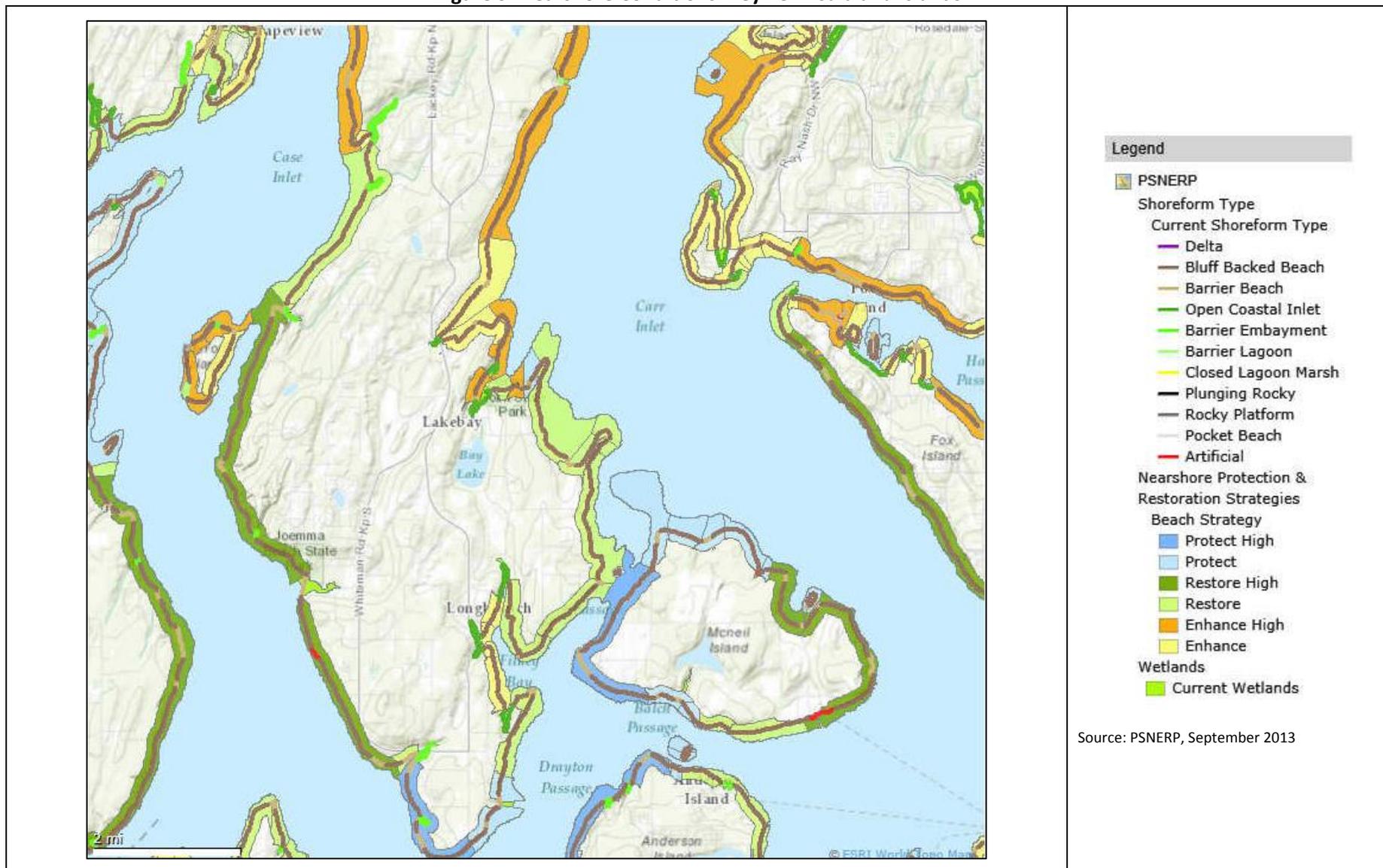
Source: PSNERP, September 2013

Figure 2. Nearshore Conditions: Nisqually Reach and Islands



Source: PSNERP, September 2013

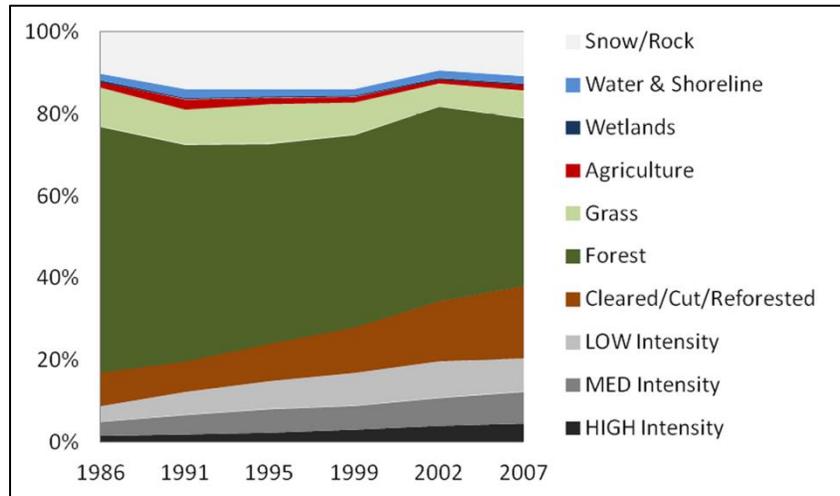
Figure 3. Nearshore Conditions: Key Peninsula and Islands



Land Cover Changes

Land cover analysis in Pierce County shows a high percentage of forest lands and a small percentage of grasslands, which do include agriculture as well as natural habitat. Over time forest and grassland have been altered as shown in Figure 4.

Figure 4. Land Cover Change



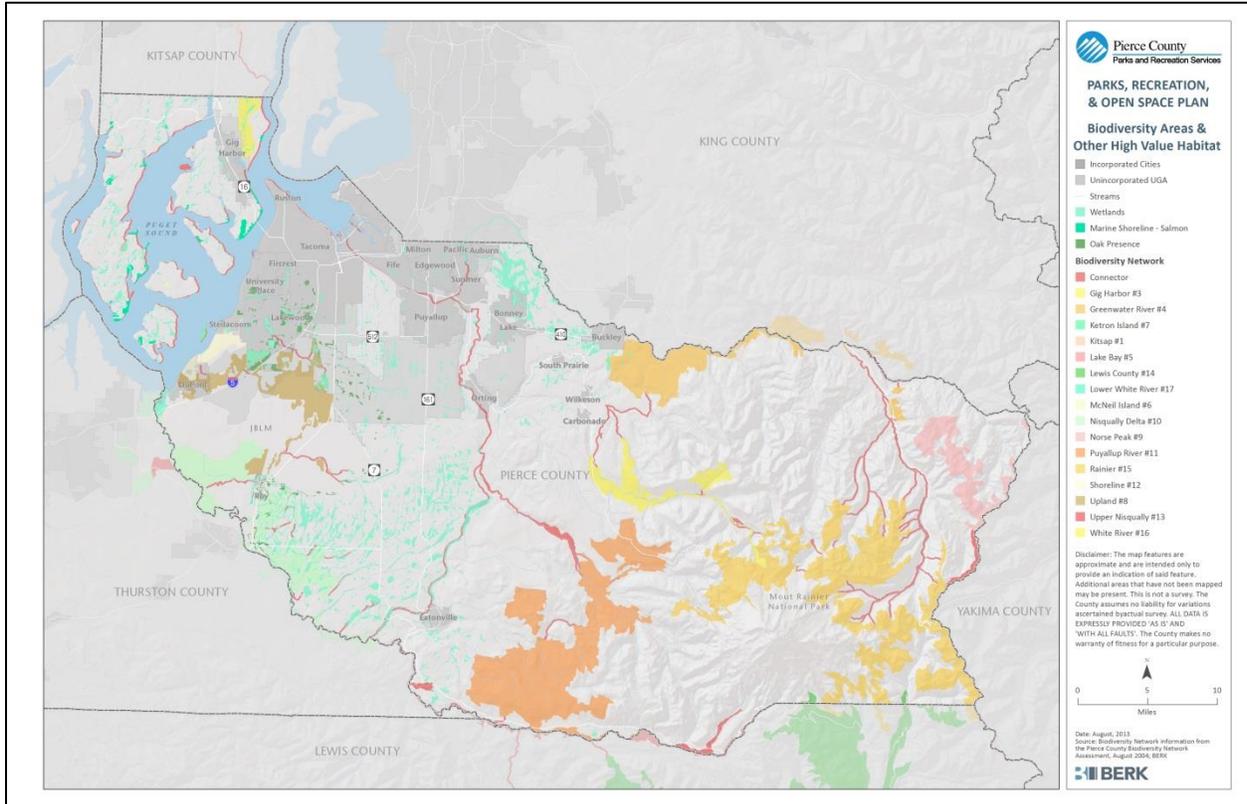
Notes: High (heavy) intensity (urban) >80% Impervious Area; Medium intensity (urban) 50–80% Impervious Area; Low (light) intensity urban 20–50% Impervious Area

Source: University of Washington Urban Ecology Research Lab, 2011, in Tacoma-Pierce County Health Department 2013

Biodiversity Network Assessment

In 2004, Pierce County partnered with a variety of agencies including the Washington State Department of Fish and Wildlife (WDFW), University of Washington, MetroParks Tacoma, Tahoma Audubon Society and the Puyallup River Watershed Council to develop the Pierce County Biodiversity Network Assessment (Brooks et al. 2004). The study aimed to “evaluate and map the lands within Pierce County that provide for the greatest biological diversity of terrestrial species (mammals, birds, amphibians and reptiles) and provided special consideration for salmonids.” The study identified 17 connected habitat areas with a richness of species important for protection as shown in Figure 5.

Figure 5. Biodiversity Network



Source: Brooks et al. 2004; BERK 2013

The species addressed in the biodiversity study included those considered:

- Triggers, including the smallest number of mapped land cover units needed to represent all terrestrial vertebrates predicted to occur in the Pierce County study area at least once;
- At-risk species considered to be most at risk of continued or future population declines due to human activities;
- State or Federally-listed as endangered, threatened, sensitive, candidate, monitor or species of concern; and
- A priority species under the PHS Program.

The full biodiversity network was evaluated through spatial mapping and field review. Connector areas were also included between species' habitats; connectors included riparian corridors supporting "salmonids and other aquatic species, which in turn may support terrestrial vertebrates." Table 2 shows Biodiversity Management Area acres within Pierce County, which total 210,125 acres. The total biodiversity acres including lands inside and outside Pierce County boundaries is about 267,784 acres.

Table 2. Biodiversity Network by Management Area within Pierce County

Management Area	Acres
3 Gig Harbor	2,817
4 Greenwater River	15,450
5 Lake Bay	147
6 McNeil Island	94
7 Ketron Island	229
8 Upland	14,612
9 Norse Peak	10,162
10 Nisqually Delta	21,823
11 Puyallup River	46,555
12 Shoreline	3,265
13 Upper Nisqually	1,617
14 Lewis County	469
15 Rainier	52,765
16 White River	8,586
17 Lower White River	820
Subtotal	179,412
Connector	30,713
Total	210,125

Note: Excludes areas outside of Pierce County, including #1 Kitsap and #2 North Bay.
 Source: Brooks et al. 2004, Pierce County GIS and BERK 2013

Most biodiversity acres are in unincorporated rural lands as shown in Table 3.

Table 3. Pierce County Biodiversity Network

Subarea	Biodiversity Network	
	Acres	
City	3,981	
Unincorporated UGAs	1,800	
Joint Base Lewis McChord	23,714	
Rural Total	180,631	
Rural Unincorporated, General	84,081	
Mount Rainier National Park	58,729	
Other State, Federal Lands	37,821	
Total County	210,125	

Source: Pierce County GIS; BERK 2013

The Pierce County Biodiversity Network Assessment indicated the relationship of the biodiversity management areas to regional conservation and ecoregional significance as follows:

- Pierce County’s greatest potential contribution to regional conservation, locally and across the Puget Trough ecoregion, is in protecting:
 - prairie and oak woodlands,
 - marine and nearshore habitats,
 - large (>150 acres) tracts of relatively contiguous evergreen forests, and
 - the maintenance of relatively undeveloped estuarine systems and riparian corridors.

- Portions or all of the North Bay, McNeil Island, Upland, Nisqually Delta, Shoreline, Lower White River, and the western portion of the Greenwater River Biodiversity Management Areas (BMAs) represent some of the most important and biologically rich habitats within biodiversity study area in Pierce County.
- Kitsap, Lake Bay and Ketron Island were included as BMAs to provide adequate representation across the County for common species, such as the painted turtle and western fence lizard. These BMAs, while of local importance, are not considered areas of ecoregional significance.
- The Carbon River Plateau, Puyallup River Riparian, and Drayton Passage-Filucy Bay represent ecoregional polygons that are not included within Pierce County BMAs. Drayton Passage-Filucy Bay is a marine-only site and the modeling process only included terrestrial species and their associated habitats. Carbon River Plateau and Puyallup River Riparian areas represent terrestrial conifer forest habitats and some freshwater sites of ecoregional significance. Since these areas are ecoregionally significant they should be addressed during any land use planning efforts once habitat quality is confirmed.

Priority Habitats and Species

Within Pierce County, one of the most comprehensive databases of habitats is WDFW's Priority Habitats and Species (PHS) program. Through this program, WDFW lists and maps unique or significant habitats, and specific fish and wildlife species that require protection including those considered by the State of Washington to be endangered, threatened, and sensitive or candidate species. WDFW also provides management recommendations. The mapping and management recommendations may be useful to PCPR and other departments in considering potential acquisitions, master planning sites, and managing lands.

Priority habitats are "habitat types or elements with unique or significant value to a diverse assemblage of species" (WDFW 2008). Mapped habitat areas tend to have one or more of these characteristics:

- Habitat areas that are larger are generally better than areas that are smaller.
- Habitat areas that are more structurally complex (e.g., multiple canopy layers, snags, geologically diverse) are generally better than areas that are simple.
- Habitat areas that contain native habitat types adjacent to one another are better than isolated habitats (especially aquatic associated with terrestrial habitat).
- Habitat areas that are connected are generally better than areas that are isolated.
- Habitat areas that have maintained their historical processes (e.g., historical fire regimes) are generally better than areas lacking such processes.

Within Pierce County, the mapped priority habitats include:

- Aspen Stands
- Biodiversity Areas & Corridors
- Herbaceous Balds
- Old-Growth/Mature Forest
- Oregon White Oak Woodlands
- West Side Prairie
- Riparian
- Freshwater Wetlands & Fresh Deepwater
- Instream

- Puget Sound Nearshore
- Caves
- Cliffs
- Snags and Logs
- Talus

Priority species are those that require protection and include those considered by the State of Washington to be endangered, threatened, and sensitive or candidate species. It also includes species considered to have recreational or commercial value or that are vulnerable:

Priority species require protective measures for their survival due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. Priority species include State Endangered, Threatened, Sensitive, and Candidate species; animal aggregations (e.g., heron colonies, bat colonies) considered vulnerable; and species of recreational, commercial, or tribal importance that are vulnerable. (WDFW 2008)

Priority fish, bird, reptile, mammal species, and invertebrate species found in Pierce County are listed in Table 4.

Table 4. Priority Habitats and Species in Pierce County

Species/ Habitats	State Status	Federal Status
Fishes		
Pacific Lamprey		Species of Concern
River Lamprey	Candidate	Species of Concern
White Sturgeon		
Pacific Herring	Candidate	Species of Concern
Longfin Smelt		
Surfsmelt		
Bull Trout/ Dolly Varden	Candidate ¹	Threatened ¹
Chinook Salmon	Candidate	Threatened ²
Chum Salmon	Candidate	Threatened
Coastal Res./ Searun Cutthroat		Species of Concern
Coho		Threatened – Lower Columbia
Kokanee		Species of Concern – Puget Sound
Pink Salmon		
Rainbow Trout/ Steelhead/ Inland Redband Trout	Candidate ³	Threatened ³
Sockeye Salmon	Candidate	Threatened – Ozette Lake
Pacific Cod	Candidate	Endangered – Snake River
Pacific Hake	Candidate	Species of Concern
Walleye Pollock	Candidate	Species of Concern
Black Rockfish	Candidate	
Bocaccio Rockfish	Candidate	Endangered
Brown Rockfish	Candidate	Species of Concern
Canary Rockfish	Candidate	Threatened
Copper Rockfish	Candidate	Species of Concern
Quillback Rockfish	Candidate	Species of Concern
Redstripe Rockfish	Candidate	
Yelloweye Rockfish	Candidate	Threatened
Yellowtail Rockfish	Candidate	
Lingcod		

Species/ Habitats	State Status	Federal Status
Pacific Sand Lance		
English Sole		
Rock Sole		
Amphibians		
Cascade Torrent Salamander	Candidate	
Larch Mountain Salamander	Sensitive	Species of Concern
Van Dyke's Salamander	Candidate	Species of Concern
Oregon Spotted Frog	Endangered	Candidate
Western Toad	Candidate	Species of Concern
Reptiles		
Pacific Pond Turtle (also known as Western Pond Turtle)	Endangered	Species of Concern
Sharptail Snake	Candidate	Species of Concern
Birds		
Common Loon	Sensitive	
Common Murre	Candidate	
Marbled Murrelet	Threatened	Threatened
Western grebe	Candidate	
W WA nonbreeding concentrations of: Loons, Grebes, Cormorants, Fulmar, Shearwaters, Storm-petrels, Alcids		
W WA breeding concentrations of: Cormorants, Storm-petrels, Terns, Alcids		
Great Blue Heron		
Brant		
Cavity-nesting ducks: Wood Duck, Barrow's Goldeneye, Common Goldeneye, Bufflehead, Hooded Merganser		
Western Washington nonbreeding concentrations of: Barrow's Goldeneye, Common Goldeneye, Bufflehead		
Harlequin Duck		
Waterfowl Concentrations		
Bald Eagle	Sensitive	Species of Concern
Golden Eagle	Candidate	
Northern Goshawk	Candidate	Species of Concern
Peregrine Falcon	Sensitive	Species of Concern
Mountain Quail		
Sooty Grouse		
W WA nonbreeding concentrations of: Charadriidae, Scolopacidae, Phalaropodidae		
Band-tailed Pigeon		
Yellow-billed Cuckoo	Candidate	Candidate
Spotted Owl	Threatened	Endangered
Vaux's Swift	Candidate	
Black-backed Woodpecker	Candidate	
Pileated Woodpecker	Candidate	
Oregon Vesper Sparrow	Candidate	Species of Concern
Purple Martin	Candidate	
Streaked Horned Lark	Endangered	Candidate
Mammals		
Dall's Porpoise		
Gray Whale	Sensitive	
Harbor Seal		
Orca (Killer Whale)	Endangered	Endangered
Pacific Harbor Porpoise	Candidate	
California Sea Lion		

Species/ Habitats	State Status	Federal Status
Steller (Northern) Sea Lion	Threatened	Threatened
Roosting Concentrations of: Big-brown Bat, Myotis bats, Pallid Bat		
Townsend's Big-eared Bat	Candidate	Species of Concern
Western Gray Squirrel	Threatened	Species of Concern
Western Pocket Gopher	Threatened	Candidate
Cascade Red Fox	Candidate	
Fisher	Endangered	Candidate
Marten		
Wolverine	Candidate	Candidate
Columbian Black-tailed Deer		
Mountain Goat		
Elk		
Invertebrates		
Geoduck		
Butter Clam		
Native Littleneck Clam		
Manila Clam		
Olympia Oyster	Candidate	
Pacific Oyster		
Dungeness Crab		
Pandalid shrimp (Pandalidae)		
Johnson's Hairstreak	Candidate	
Mardon Skipper	Endangered	
Puget Blue	Candidate	
Valley Silverspot	Candidate	Species of Concern
Taylor's Checkerspot	Endangered	Candidate

Source: WDFW 2008

Notes:

- 1 Bull Trout only.
- 2 Upper Columbia Spring run is Endangered.
- 3 Steelhead only.

Within Pierce County considering a wide array of habitats including PHS maps and County maps of critical salmon habitat, oak lands, and eelgrass, there is a sizable number of acres considered potential fish and wildlife habitat, approximately 307,574 acres or 481 square miles, excluding city, state, and federal lands. See Table 5.

Table 5. Possible Fish and Wildlife Areas

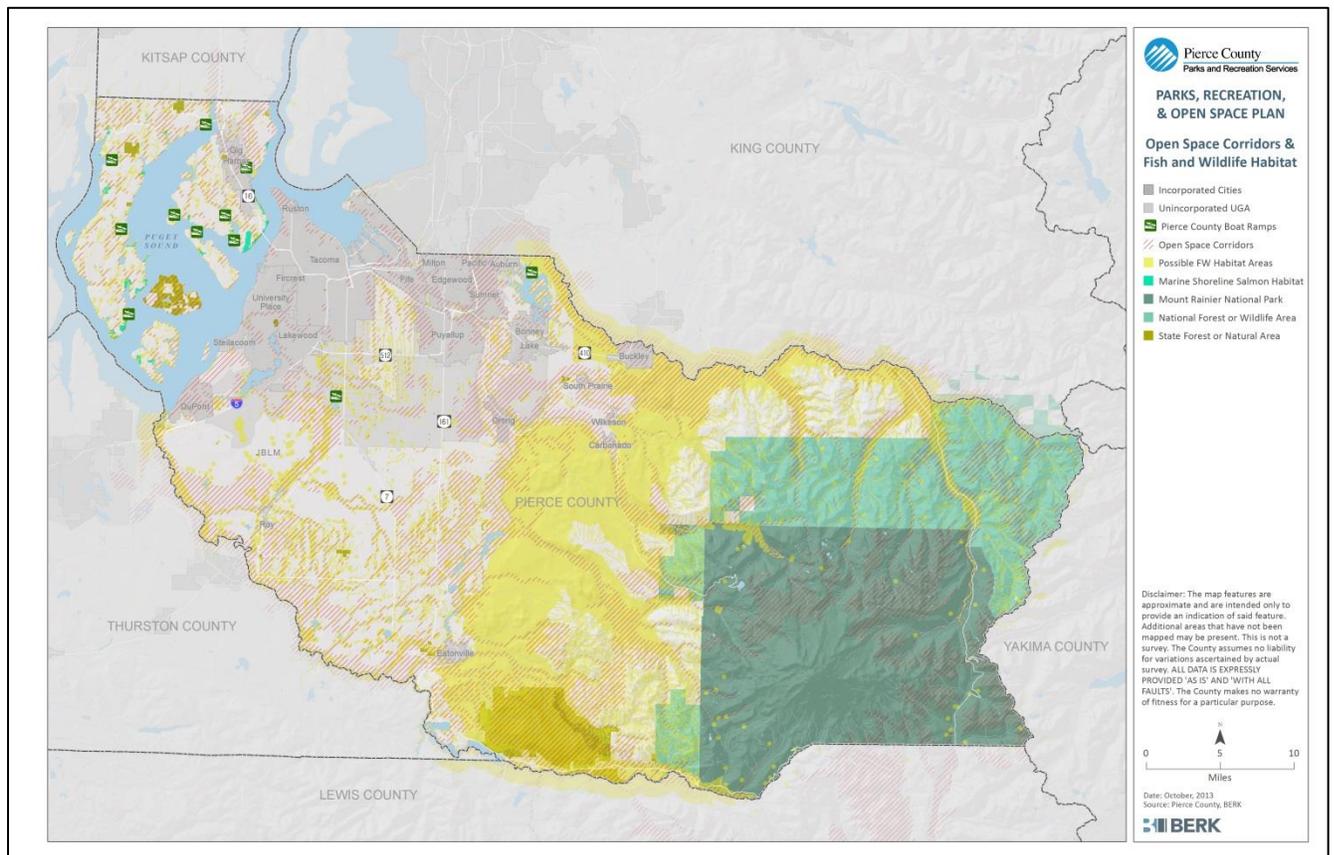
Subarea	Potential Fish and Wildlife Habitat (Acres)
City	33
Unincorporated UGAs	8,908
Joint Base Lewis McChord	14,380
Rural Total	360,379
Rural Unincorporated, General	298,666
Mount Rainier National Park	5,505
Other State, Federal Lands	56,209
Total County	383,700

Notes: Pierce County GIS indicates data was acquired from numerous State and local agencies to form a single potential fish and wildlife habitat conservation area map. Reviewing the data more closely, the information appears to largely consist of WDFW PHS information.

Source: Pierce County GIS; BERK 2013

Figure 6 shows Possible Fish and Wildlife Areas mapped by Pierce County, WDFW and others. The map also shows the relationship of the Possible Fish and Wildlife Areas to the Pierce County Open Space Map of the Comprehensive Plan (further described below).

Figure 6. Possible Fish and Wildlife Areas



Total Habitat Area

If adding all mapped habitats described above together –marine shoreline critical salmon habitat, streams and shorelines (with 200 foot buffers), wetlands, oak lands, biodiversity management areas, and other possible fish and wildlife habitat (e.g. PHS and county habitat maps) – and removing overlapping areas (e.g. wetlands, streams and shoreline estimates), the net habitat acres in the county equal about 523,857 acres or 819 square miles. See Table 6. This equals roughly 45% of the County’s total 1,800 square miles of water and land.

Some of the land is protected through governmental ownership – about 32% of the habitat acres are on properties that are part of Mount Rainier National Park, Joint Base Lewis McChord, and other major state and federal lands. There would be additional lands owned by local governments and non-profit groups. Other habitats would be protected through critical area and shoreline regulations – roughly 15%. Ownership by governmental agencies and protection through critical area and shoreline regulations is important to help avoid ecological degradation, though it would not necessarily result in habitat improvements, such as restoration.

Table 6. Total Estimated Habitat Acres in Pierce County

Subarea	Acres
City	8,901
Unincorporated UGA	11,001
Joint Base Lewis McChord	30,310
Rural Total	473,644
Rural Unincorporated, General	334,567
Mount Rainier National Park	67,678
Other State, Federal Lands	71,400
Total	523,857

Source: Pierce County GIS; BERK 2013

Habitat Protection Regulations, Programs & Incentives

This section describes current plans and regulations that protect habitats in Pierce County. Some of the plans are a source of priorities and capital projects for habitat protection.

Open Space Plan

Pierce County has an adopted Open Space Element including policies and a map of Open Space Corridors (the current adopted map is dated March 1, 2007). The intent of the map is to identify lands that serve as buffers within and between UGAs, as well as to provide general guidance for open space preservation efforts. (Pierce County 2013) See Figure 7.

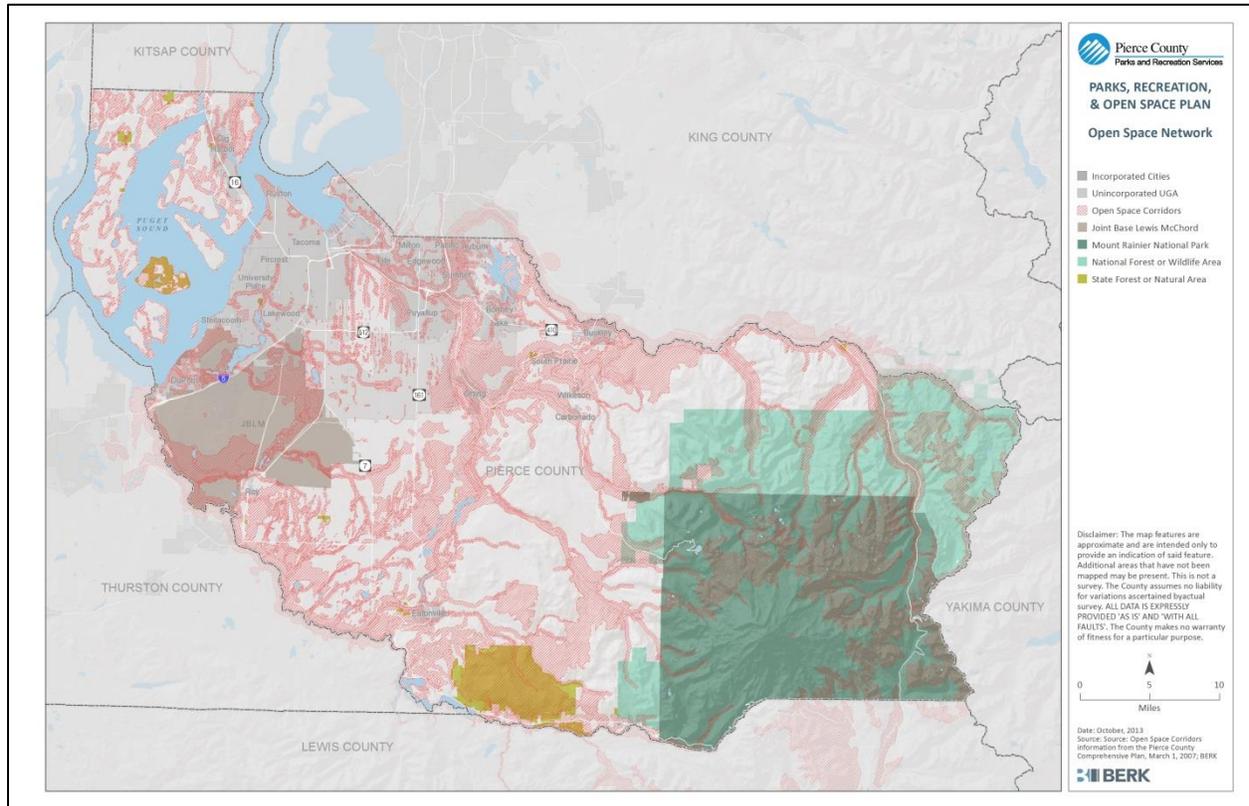
The open space corridors are primarily made up of habitats as well as resource lands including:

- Critical Salmon Habitat
- Agricultural Lands
- Fish and Wildlife Habitat Conservation Areas
- Marine Waters
- Streams
- Wetlands, Estuaries, and Tidal Marshes
- Wooded Areas
- Prairie Land
- Tracts that provide linkage and access to said open space areas

Fish and Wildlife Habitat Conservation Areas is a broad term inclusive of many habitats such as marine, estuarine, freshwater, and terrestrial habitats:

... those areas identified as being of critical importance to maintenance of fish and wildlife species including: areas with which endangered, threatened, and sensitive species have a primary association; habitats and species of local importance; commercial and recreational shellfish areas; kelp and eelgrass beds; herring and smelt spawning areas; naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat; state natural area preserves, natural resource conservation areas; and land located within the Pierce County Biodiversity Network as identified in the Pierce County Biodiversity Network Assessment report dated August 2004. (PCC Chapter 19D.170)

Figure 7. Open Space Corridors



Source: Pierce County 2007; BERK 2013

Because the Open Space Plan is based to a large degree on habitat features and maps highly valued lands, it is an important guide to open space conservation priorities for the PROS Plan and other County programs (see PCC Chapter 19D.170). The map does not imply that the mapped lands are open to public access; whether a given area is suitable for access is dependent on the purpose of open space and its sensitivity. Recreation lands with little environmental sensitivity are meant for public use. However, sensitive habitats may not be suitable for public access. Open space lands that serve to protect public health and safety (e.g. flood control) may also be unsuited to public access.

Watershed Plans

There are several watershed resource inventory areas (WRIAs) in or partially including Pierce County including:

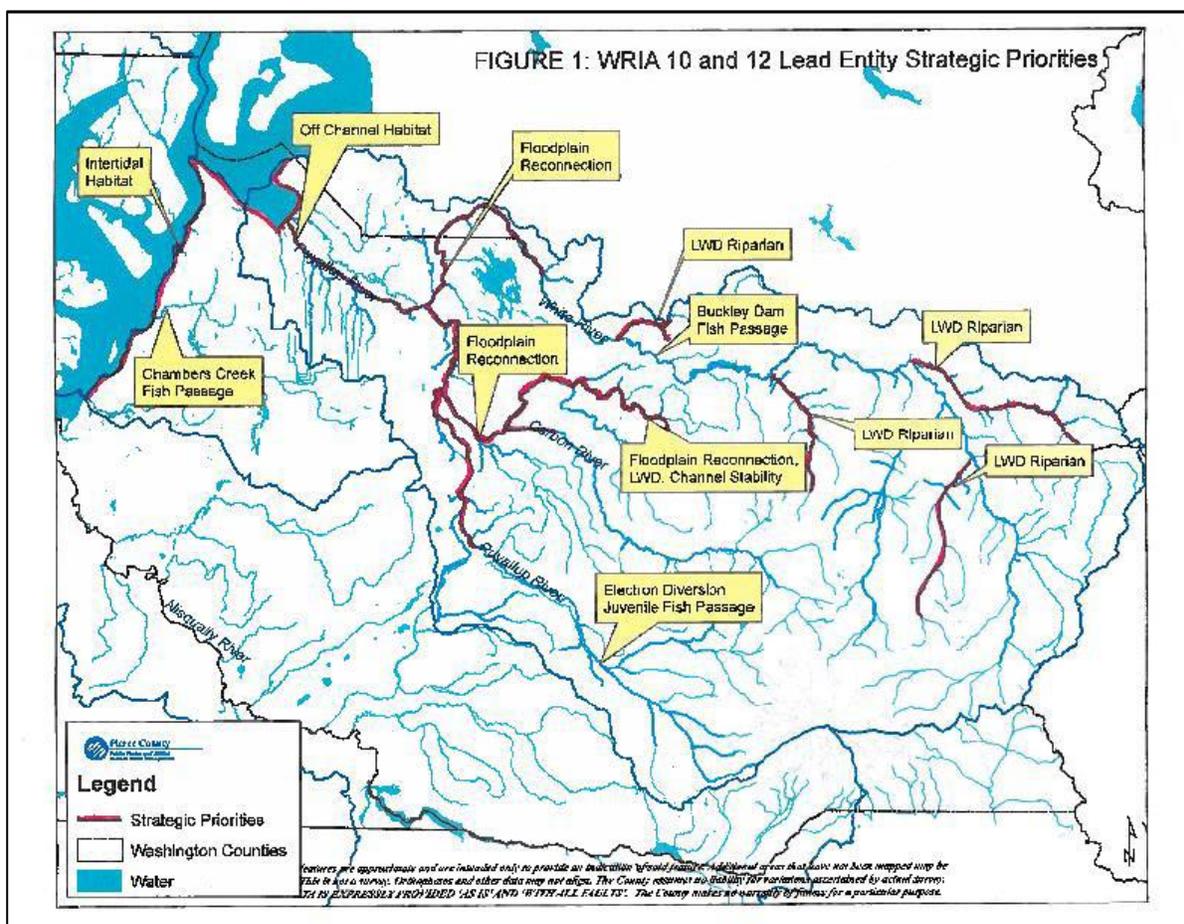
- WRIA 10 - Puyallup-White
- WRIA 11 - Nisqually
- WRIA 12 - Chambers-Clover
- WRIA 15 - Kitsap
- WRIA 26 - Cowlitz
- WRIA 38 - Upper Yakima

Watershed plans have been developed for WRIAs 10, 11, and 12 to manage water resources and protect habitat.

- WRIA 10 plans include: Lower (1995) and Upper (2002) Puyallup Characterization and Action Plans addressing baseline ecological conditions and an action plan for water quality and nonpoint pollution reduction. Basin Plans for Mid Puyallup (2005), Clear/Clark (2006), and White River (draft) which identify and prioritize capital improvement projects and other surface water management activities.
- WRIA 11: The Nisqually Watershed Plan was completed in 2004. A final Detailed Implementation Plan was completed in April 2007.
- WRIA 12: The Chambers-Clover Planning Unit completed a draft watershed plan in September 2004, but was unable to reach consensus, and as a result, the plan was not approved.

A joint WRIA 10 and WRIA 12 Salmon Habitat Protection and Restoration Strategy was developed by Pierce County as Lead Entity (March 2012). Figure 8 shows the strategic priorities which include nearshore habitat restoration, riverine off channel habitat, floodplain reconnection, fish passage barrier removal, riparian habitat restoration, and others.

Figure 8. WRIA 10 and 12 Lead Entity Strategic Priorities



Source: Pierce County Lead Entity, Puyallup & Chambers-Clover Watersheds, March 2012

Salmon habitat proposals could be eligible for WWRP grants and other grant programs supported by the Recreation and Conservation Office. Projects are listed below in Table 7 and Table 8. Additionally, as of 2013, projects that are active and not otherwise completed or funded are included in the attachment.

Table 7. Salmon Habitat Protection and Restoration Strategy: Long-term Priorities with High Benefit

Reach	Species	Habitat type	Recommended Action	Actions/Needs	Rationale	Comments
Puyallup Estuary (RM 0 – 6.0)	Chinook, coho, steelhead, bull trout cutthroat	Rearing, refuge	Acquisition, restoration	Create off-channel estuarine habitat	High benefit for Chinook fry rearing, osmoregulation	As a group, 2 nd highest benefit type of project
Puyallup River (RM 6.0 to 22)	Chinook, coho, steelhead, bull trout cutthroat	rearing	Acquisition and restoration	Setback levees, floodplain reconnection	High benefit for Chinook fry colonization and rearing	As a group, highest benefit type project
White River (RM 0 to 10)	Chinook, coho, steelhead, bull trout cutthroat	rearing	Acquisition and restoration, normalized flows	Setback levees, floodplain reconnection	High benefit for Chinook fry colonization and rearing	As a group, highest benefit type project
Carbon River (RM 0 to 10)	Chinook, coho, steelhead, bull trout cutthroat	rearing	Acquisition and restoration	Setback levees, floodplain reconnection	High benefit for Chinook fry colonization and rearing	As a group, highest benefit type project
Puyallup River at Electron Dam (RM 31.2)	Chinook, coho, steelhead, bull trout	Out-migration	screening	Need adequate screening on Electron diversion canal	80% loss of canal migrants	Highest ranked individual project
White River Diversion Dam at Buckley (RM 24.3)	Spring Chinook, coho, bull trout, steelhead	Upstream migration	New fish passage facility	Need free passage of spring Chinook, coho and other salmon especially during odd numbered pink runs	Direct mortality at dam and delayed/displaced spawning	Post EDT process problem, possibly highest ranked individual project if EDT is updated

Source: Pierce County Lead Entity, Puyallup & Chambers-Clover Watersheds, March 2012

Table 8. Salmon Habitat Protection and Restoration Strategy: Near Term Priorities: Moderate – High Benefit

Reach	Species	Habitat type	Recommended Action	Actions/Needs	Rationale	Comments
S. Prairie Creek	coho, steelhead	Rearing	Restoration	Restore floodplain/wetland connectivity to the river	Benefits coho abundance and productivity	% increase in abundance and productivity
S. Prairie Creek	Chinook, coho, pink, steelhead	Spawning, rearing	Protection Restoration	LWD, channel structure, sinuosity	Active spawning area	Habitat diversity limiting
Boise Creek	Chinook, coho, steelhead	Spawning, rearing	Restoration	LWD, riparian	Benefits Chinook abundance and productivity	2 of 10 top ranked projects for lower river fish

Reach	Species	Habitat type	Recommended Action	Actions/Needs	Rationale	Comments
Clover Creek	coho	migration	Restoration	Barrier removal	15 – 22% increase in abundance from each project	Shera's Falls Blocking Culverts above Spanaway Lake
WRIA 12 Nearshore	Chinook, chum, bull trout, coho	Juvenile rearing	Restoration	Barrier removal, intertidal habitat	Some uncertainty	Chambers dam removal, and beach feeding along the BNSF rail line
Greenwater River	Chinook, bull trout, coho	Spawning, rearing	Restoration	LWD, riparian, road management	Ranked 3 & 4 for upper river fish	
Huckleberry Creek	Chinook, bull trout, coho	Spawning rearing	Restoration	LWD, riparian, road management	Ranked 6th & 8th for upper river fish	
Clearwater River	Chinook, bull trout, coho	Spawning, rearing	Restoration, Protection	LWD, riparian, Road Management	High priority geographic area in EDT Phase 2	
Commence-ment Bay	Chinook, bull trout, coho	juvenile rearing	Restoration	protect, restore or create intertidal and shallow subtidal habitat	The Outer Hylebos project was ranked 5th, 9th, and 10th for Lower White, Upper White, and Puyallup Chinook, respectively	The Outer Hylebos project is listed in the Recovery Plan as a project to initiate within ten years

Source: Pierce County Lead Entity, Puyallup & Chambers-Clover Watersheds, March 2012

Shoreline Master Program

Pierce County has developed a Shoreline Master Program (SMP) update which has been locally adopted and is undergoing Washington State Department of Ecology review. When fully adopted the program will include goals, policies, and regulations to protect ecological functions of shoreline water bodies including all marine shorelines, streams greater than 20 cubic feet per second, and associated wetlands. The SMP update also includes a non-regulatory restoration plan intended to identify proposals that would improve shoreline habitat functions and values directly or indirectly. In addition, the SMP promotes public access to the shoreline.

Projects addressed in the Shoreline Master Program Restoration Plan are derived from watershed plans and other governmental plans, and include: nearshore habitat restoration, floodplain reconnection, fish passage barrier removal, riparian habitat restoration, and others. These projects may be eligible for WWRP grants. See attachment for lists of projects.

Pierce County Rivers Flood Hazard Management Plan

The Pierce County Rivers Flood Hazard Management Plan was completed in 2013 and serves as a 20-year plan to address and manage flooding and channel migration hazards on the major rivers, large tributaries and associated floodplains within Pierce County. The focus of recommendations is to implement programmatic and capital projects to reduce flooding hazards. Some proposals address habitat, such as a levee setback with side channel habitat. Some projects or elements that address habitat may be eligible for WWRP grants. See attachment for lists of projects.

Critical Areas Regulations

The Pierce County Code includes regulations to identify and protect wetlands, fish and wildlife conservation areas including streams and lakes, aquifer recharge areas, flood hazard areas, and geologic hazard areas. These regulations include the application of buffers to retain associated habitat (e.g. riparian areas) or to keep development away from hazard areas (e.g. steep slopes). These regulations are applied to public and private applications for development. Where critical areas regulations are found to be adequately protecting habitats, there may be a lesser priority for acquisition or other means of protection.

Federal Endangered Species Act

Impacts on federally listed species are minimized or avoided through compliance with the Endangered Species Act (ESA). The ESA protects species whose populations are declining to the point where they are now at risk of extinction, or are likely to be in the future. These regulations help protect particular species; they do not comprehensively protect ecosystems.

State Environmental Policy Act (SEPA)

Under SEPA, all state and local agencies consider environmental impacts of plans and permits before actions are taken, including identifying environmental impacts and determining mitigation measures to be applied. The County uses its SEPA authority as well as other county codes to require mitigation for impacts such as drainage, habitat, and water quality. SEPA provides a process to consider impacts to habitats but by itself does not serve as a source of habitat protection.

Zoning and Development Regulations

In Open Space Corridors, the County's land use development regulations (PCC 18J.15) require minimum native vegetation retention. In urban areas the requirements range at 15-25% of the Open Space Corridor and in rural areas at 25-65% of the Open Space Corridor area on the lot. Critical areas and their buffers are the primary locations for native vegetation retention, as well as perimeter lot landscaping.

Conservation Futures

In Chapter 2.98 the Pierce County Code establishes selection criteria and procedures for Pierce County to acquire conservation futures property using conservation futures funds. The following types of lands are considered for acquisition:

Resource Conservation

Agricultural Lands
Timber Lands
Wooded Areas

Biodiversity Conservation

Critical Salmon Habitat
Fish and Wildlife Habitat Conservation Areas
Prairie Land

Marine Shoreline Conservation

Marine Waters
Marine Estuaries and Tidal Marshes

Lake, River and Stream Conservation

Streams and Rivers
Lakes

Trail Conservation

Trails and Corridors

Natural Heritage Conservation
Open Space Passive Recreation Areas
Parks with Active Recreation Areas
Scenic Viewpoints and Corridors
Archaeological and Historic Landmark Sites

This program can help implement habitat protection for numerous habitat types. This Habitat Element could help provide some guidance in terms of priorities and strategies for the program.

Current Use Taxation

The Current Use taxation program (RCW 84.34), established by the State Legislature in 1970, allows landowners tax relief when their land use meets certain criteria for farm and/or agriculture, timber land, and open space. Related to the Current Use program, but slightly different, is the current use assessment for Designated Forest Land Program (RCW 84.33). The Designated Forest Land Program is a criteria base program that allows for a special land assessment for forests in active production.

Whereas for farm, agriculture and timber land programs the current use taxation program has little discretion, counties have the option to install a Public Benefit Rating System (PBRs) for open space lands. The PBRs allows for a criteria-based, flexible method for evaluating applicants for the open space current use program. The rating system helps determine the “value” of the land in question and commensurately award property tax relief. Pierce County has developed a PBRs, described as follows:

As authorized by RCW 84.34 the Pierce County Code 2.114, Ordinance 98-114s, adopted a Public Benefit Rating System (PBRs), for applicants, which ranks various open space features... and is composed of high, medium and low priority resources, bonus categories and a super bonus category. A minimum of three priority resources points is necessary to qualify for the program and a maximum of 15 priority points is allowed. The number of PBRs points correlates to a percent of market value reduction during the period of continued eligibility.

This program provides short-term relief from potential land conversion pressures, but does not protect or restore habitats.

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Attachment

Habitat Plans and Projects

Habitat Protection Proposals: October 2013

	A	B	C	D	E	F
	Project Type	Plan Category	Project Name	Project Summary	Priority tier of project	Limiting Factors
1	Capital	Acquisition	Puyallup River (Union Pacific) Setback Levee (RM 2.6-3.0) - Acquisition	Acquire up to 30 acres of floodplain and former intertidal habitat; acquisition would allow for construction of setback levee and restoration of intertidal habitat in the transition zone for juvenile rearing.	1	Estuarine and Nearshore Habitat, Degraded Habitat-Estuarine and Nearshore Marine
2	Capital	Acquisition	South Prairie Creek Acquisition (RM 0-8)	Protect 60-120 acres of instream and riparian habitat along South Prairie Creek, primary tributary to the Carbon River and the most important salmonid spawning area in the Puyallup watershed	1	Degraded Habitat-Channel Structure and Complexity, Degraded Habitat-Floodplain Connectivity and Function, Degraded Habitat-Riparian Areas and LWD Recruitment, Degraded Habitat-Water Quality
3	Capital	Acquisition	White River Land Acquisition	Acquire ecologically important land within the White River watershed.	1	Degraded Habitat-Riparian Areas and LWD Recruitment
4	Capital	Acquisition/Restoration	West Hylebos Creek acquisition	This project completes the purchase, preservation, and restoration of the properties detailed in the recovery strategy. It brings total of this restoration action to approx. 35 acres of the most productive habitat on this fork of the Hylebos.	1	Degraded Habitat-Channel Structure and Complexity, Degraded Habitat-Floodplain Connectivity and Function, Degraded Habitat-Riparian Areas and LWD Recruitment
5						

	A	B	C	D	E	F
	Project Type	Plan Category	Project Name	Project Summary	Priority tier of project	Limiting Factors
1	Capital	Acquisition/ Restoration	Middle Boise Creek Acquisition (RM 1-3)	Purchase land in fee or conservation easements to facilitate the restoration of aquatic and riparian habitat in and along Boise Creek between RM 1 – 3.	1	Degraded Habitat-Riparian Areas and LWD Recruitment, Degraded Habitat-Stream Substrate
6	Capital	Restoration	Boise Creek Preliminary Design: Channel Relocation @ Golf Course	The Puyallup Tribe of Indians used this grant to complete a preliminary design for relocating Boise Creek to its historic channel within the Enumclaw Golf Course.	1	Degraded Habitat-Floodplain Connectivity and Function
7	Capital	Restoration	Buckley Dam Fish Passage Improvements	Update fish passage facilities owned by Army COE. Project located at mile 24.3 of the White River. The project is to provide safe fish passage to all fish species, including three listed species. The dam in its current state is resulting in delay, injury and mortality of all species, particularly in odd years when pink salmon are abundant.	1	
8	Capital	Restoration	Chambers Bay Estuarine and Riparian Enhancement	This goal of this project is to restore and enhance the estuarine habitat structure within Chambers Bay; as well as, to restore marine riparian corridor in and around Chambers Bay and increase salt marsh and estuarine area inside the Bay. Currently, there is a lack of riparian and habitat structure inside Chambers Bay for rearing and foraging salmonids.	1	Degraded Habitat-Estuarine and Nearshore Marine, Estuarine and Nearshore Habitat, Degraded Habitat-Riparian Areas and LWD Recruitment
9						

Habitat Protection Proposals: October 2013

	A	B	C	D	E	F
	Project Type	Plan Category	Project Name	Project Summary	Priority tier of project	Limiting Factors
1	Capital	Restoration	Chambers Beach Reconstruction and Riparian Enhancement	The Chambers Beach Reconstruction and Riparian Enhancement project will reconstruct natural beach profiles along Chambers Beach and provide active nourishment of degraded areas in key locations within the drift cell. Restoration efforts will also reconstruct a riparian corridor in select areas through removal of invasive species and planting of native vegetation.	unrated	Degraded Habitat-Riparian Areas and LWD Recruitment, Estuarine and Nearshore Habitat, Degraded Habitat-Estuarine and Nearshore Marine
10	Capital	Restoration	Chambers Creek Adult Trap and Juvenile Acclimation Facility Improvements	Rebuild ponds and intake, and install pollution abatement system (HSRG recommendations) to improve upstream passage for non-target wild stocks; improve acclimation for smolts and adult holding for returning Chinook; establish pollution abatement system for effluent; and improve screen to minimize impacts on wild stocks.	Unrated	Degraded Habitat-Fish Passage
11	Capital	Restoration	Commencement Bay - Puget Creek Estuary Restoration	Remove contaminated sediment, sediment replacement, softening of rip-rap shoreline with gravel/cobble mix, restore eelgrass beds, restore sand lance spawning.	2	Degraded Habitat-Estuarine and Nearshore Marine, Estuarine and Nearshore Habitat
12	Capital	Restoration	Deer Creek Channel Restoration	Deer Creek runs through Puyallup, in Pierce County, with headwaters in unincorporated Pierce County, near 106th Street E, running 3.5 miles north to the Puyallup River in the City. This proposed restoration for Deer Creek includes the restoration of a 1,500-foot section of the stream beginning just south of 12th Ave SE and west of Shaw Road in Puyallup, running northwest to the corner of 25th Street SE and 12th Ave SE.	2	Unknown
13	Capital	Restoration	Develop Nearshore Projects	Use comparable benefits protocols for synchronized project selection - Using existing nearshore assessments develop protocols for nearshore project identification, development and prioritization.	Unrated	Unknown
14	Capital	Restoration	East Hylebos Ravine Habitat Restoration	Extends the habitat restoration actions just north of the West Milton Nature Preserve (located on the east fork). Stream bank stabilization and upland restoration in the most productive area on the East Fork of the Hylebos.	Unrated	Degraded Habitat-Channel Structure and Complexity, Degraded Habitat-Floodplain Connectivity and Function, Degraded Habitat-Riparian Areas and LWD Recruitment
15						

Habitat Protection Proposals: October 2013

	A	B	C	D	E	F
	Project Type	Plan Category	Project Name	Project Summary	Priority tier of project	Limiting Factors
1	Capital	Restoration	Electron Dam Diversion Fish Screening	Install inclined floor screen structure on flume at Electron Dam diversion to reduce juvenile mortality during out migration. Outlet of Flume located at Electron Forebay. Diversion, inadequate screening. Approximately 50% of downstream migrant juveniles enter the diversion. Approx. 20% of those are trapped and returned to the river.	1	Degraded Habitat-Fish Passage
16	Capital	Restoration	Garrison Springs Restoration	Conduct feasibility study to see if Garrison Springs can be used to release juvenile Chinook from the WDFW hatchery to Puget Sound. The study would also estimate the cost of any alterations needed to permit the fish to successfully reach the Sound.	Unrated	Unknown
17	Capital	Restoration	Improvements at the Buckley Fish Trap	Explore opportunities to improve fish passage at Buckley.	1	Unknown
18	Capital	Restoration	Middle Boise Creek Restoration Planning	King County is in the process of developing a Habitat Restoration Plan for Middle Boise Creek (RM 1-3) to identify approximately five to six habitat Restoration that could be constructed within the next ten years. A more comprehensive hydraulic model of the middle Boise Creek reach is important prior to constructing Restoration.	2	
19	Capital	Restoration	Narrows and Sequatchew-Steilacoom Feeder Bluff Reconnection	Reconnect priority (historic) feeder bluffs along Nisqually to Point Defiance shoreline in the Tacoma Narrows and between Sequatchew Creek and Steilacoom to restore lost process of sediment input. Feeder bluff reconnection could be accomplished by installing trestles under the BNSF railroad at key locations.	Unrated	Estuarine and Nearshore Habitat, Degraded Habitat-Riparian Areas and LWD Recruitment, Degraded Habitat-Estuarine and Nearshore Marine
20	Capital	Restoration	Pacific Right Bank Levee Setback (RM 5.5 - 6.3)	This project is located on the right bank of the Lower White River in the City of Pacific, between River Mile 5.5 and 6.3. The project will reduce flood risk in a way which restores habitat and habitat forming processes. The project will remove over 4,100 linear feet of existing revetment and other artificial fill, reconnect the river to a broader portion of its floodplain, build a setback levee to limit the bounds of flood and erosion hazards in this reach, and improve the riparian buffer and wetlands.	1	Degraded Habitat-Estuarine and Nearshore Marine, Degraded Habitat-Channel Structure and Complexity, Degraded Habitat-Riparian Areas and LWD Recruitment
21						

	A	B	C	D	E	F
1	Project Type	Plan Category	Project Name	Project Summary	Priority tier of project	Limiting Factors
22	Capital	Restoration	Pocket Beach Enhancement/Nourishment Pilot: Sequelitchew to Solo Point	Initiate a pilot beach restoration and marine riparian planting projects on existing pocket beaches persisting waterward of the BNSF railine between Sequelitchew Creek and Solo Point to monitor and streamline beach nourishment and riparian enhancement techniques along the degraded shoreline.	1	Degraded Habitat-Estuarine and Nearshore Marine, Estuarine and Nearshore Habitat
23	Capital	Restoration	Puget Creek Rearing Pond	An off-channel pond will be developed to provide an acclimation area for out-migrating Coho smolts and Chum fry. This area has an influx of marine water at high tide, which would benefit the out-migrating smolts/fry so they can be better situated for survival. This pond could also work in the reverse for in-migrating adult salmonids.	2	Degraded Habitat-Estuarine and Nearshore Marine, Estuarine and Nearshore Habitat
24	Capital	Restoration	Sequelitchew Creek Estuary Reconnection	Restore estuarine processes to Sequelitchew Creek Estuary through placement of a large rail trestle across the mouth of the estuary.	1	Estuarine and Nearshore Habitat, Degraded Habitat-Estuarine and Nearshore Marine
25	Capital	Restoration	Sequelitchew Creek Estuary-Beach and Riparian Restoration	Remove derelict creosote pilings and bulkhead structures, restore natural beach profile, remove invasive plants and restore native, marine riparian corridor at the mouth of Sequelitchew Creek on the WRIA 12 shoreline, Northeast of the Nisqually reach.	2	Degraded Habitat-Estuarine and Nearshore Marine, Estuarine and Nearshore Habitat
26	Capital	Restoration	Setback Levee 24th St (White River RM 2.3-3.7), Prelim Design	This project studied the feasibility of several options to provide flood control and/or habitat benefits on the White River in the area near 24th Street East, between RM 2.3 and 3.7 (left bank). The City of Sumner currently owns over 100 acres of the project site; several isolated parcels are not owned by the City. design/permitting/administration). A preliminary design (30%) for the 5,280', 10 ac side channel was also funded by this project.	1	Degraded Habitat-Floodplain Connectivity and Function, Degraded Habitat-Riparian Areas and LWD Recruitment, Degraded Habitat-Fish Passage

Habitat Protection Proposals: October 2013

	A	B	C	D	E	F
	Project Type	Plan Category	Project Name	Project Summary	Priority tier of project	Limiting Factors
1	Capital	Restoration	SPC Riparian Restoration Planning Project	This project will complete engineering for removal of manmade structures at the former Inglin Dairy property, now part of the South Prairie Creek Reserve.	Unrated	
27	Capital	Restoration	Swan Creek Restoration channel geometry at Pioneer Way	Restore channel geometry in Swan Creek at Pioneer Way. There is high potential for restoration according to modelling by EDT - Sediment detention pond upstream.	Unrated	Degraded Habitat-Channel Structure and Complexity, Degraded Habitat-Floodplain Connectivity and Function, Degraded Habitat-Riparian Areas and LWD Recruitment
28	Capital	Restoration	Titlow Estuary Restoration - Construction	Restore Titlow Lagoon to a connected and productive estuary. Construction efforts include: Replace a culvert/tidegate through BNSF RR with a large-span rail bridge to connect habitat and fish passage between Titlow Lagoon and Puget Sound ;Remove a 50-meter pool and parking lot on the footprint of the historic Lagoon/saltwater wetland; Expand existing lagoon and install woody habitat structure; Removal invasive plants and restoration riparian and salt marsh habitat; Removal of a house, sea wall, and rip rap bulkhead		Degraded Habitat-Fish Passage, Degraded Habitat-Estuarine and Nearshore Marine
29	Capital	Restoration	TransCanada Levee (RM9.0-9.3)-Final Design, Construction	The TransCanada Levee Modification Project will modify the TransCanada Levee according to the recommendations in the TransCanada Levee Setback Feasibility Study completed by King County in 2011.	1	Degraded Habitat-Floodplain Connectivity and Function, Degraded Habitat-Riparian Areas and LWD Recruitment, Degraded Habitat-Channel Structure and Complexity
30	Capital	Restoration	Update Regional Culvert Study	Re-evaluate the system to check on work done since the original study was completed - function of those removed and make sure there are not any new ones.	Unrated	Degraded Habitat-Fish Passage
31						

	A	B	C	D	E	F
	Project Type	Plan Category	Project Name	Project Summary	Priority tier of project	Limiting Factors
1	Capital	Restoration	Upper White Road Decommissioning	This project would plan and implement road decommissioning in floodplains throughout the upper White River (Greenwater River/ Huckleberry Creek/West Fork White River). This project would involve creating an access/travel management plan as well as on-the-ground work (include removing culverts, pulling back unstable fill, recontouring slopes, outsloping, water-barring, road-bed ripping, and revegetating).	Unrated	Degraded Habitat-Channel Structure and Complexity, Degraded Habitat-Floodplain Connectivity and Function, Degraded Habitat-Riparian Areas and LWD Recruitment, Degraded Habitat-Stream Substrate
32	Capital	Restoration	White River Knotweed Control Project Phase 1	Knotweed is a highly destructive and exceedingly robust non-native invasive perennial that is spreading aggressively throughout the White River basin. The plant currently thrives along the riverbanks and adjacent roadsides of the basin. In addition to its rapid growth and ability to take advantage of floods to spread even further, knotweed has an extensive underground root network that makes it exceedingly difficult to kill.	unrated	Biological Processes
33	Capital	Restoration	White River Restoration Assessment	Evaluate historic and current reaches of the White River important for salmon habitat and identify 10 priority habitat restoration actions that can be implemented within 10 years.	Unrated	Unknown
34	Non-Capital	Coordination	State/Local/NOAA TRT Technical Support	Provide access to state and local agency resources for better coordination and integration of plan components. Also to ensure the support of NOAA's TRT remains constant to help with the salmon recovery efforts.	Unrated	Unknown
35	Non-Capital	Feasibility	Chambers Estuary Restoration Planning Project	This project will conduct preliminary planning for the restoration of Chambers Estuary, primarily through acquisition of part or all of the "Abitibi" site. Eventual project outcomes include;	1	
36						

Habitat Protection Proposals: October 2013

	A	B	C	D	E	F
	Project Type	Plan Category	Project Name	Project Summary	Priority tier of project	Limiting Factors
1						
37	Non-Capital	Monitoring	Fish Tagging for Chinook Tracking	Fish tagging to track Chinook - trapping and tagging salmonid smolts for monitoring distribution and habitat usage and timing (POST tag) adaptive management [Increase telemetry and hydro-acoustic tagging of Chinook and Steelhead in system]	Unratred	Unknown
38	Non-Capital	Monitoring	Mud Moutain Dam Mortality Study	Assess the survival of adult and juvenile fish through Mud Moutain dam.	Unratred	Unknown
39	Non-Capital	Monitoring	Nearshore Restoration Project Effectiveness Monitoring	Develop and implement a nearshore effectiveness monitoring plan for future Restoration.	Unratred	Unknown
40	Non-Capital	Monitoring	Smolt Trapping- Chambers Creek	Operate smolt trap on Chambers Creek - \$150,000 per year - includes manning site; monitoring also includes counting and identifying returning adult salmon.	Unratred	Unknown
41	Non-Capital	Monitoring	Smolt Trapping- Puyallup River	Operate smolt trap on the Puyallup River - \$150,000 per year - includes manning site.	Unratred	Unknown
42	Non-Capital	Monitoring	Smolt Trapping- South Prairie Creek	Operate smolt trap on South Prairie Creek - \$150,000 per year - includes man on site.	Unratred	Unknown

	A	B	C	D	E	F
	Project Type	Plan Category	Project Name	Project Summary	Priority tier of project	Limiting Factors
1						
43	Non-Capital	Monitoring	Smolt Trapping- White River	Operate smolt trap on the White River - \$150,000 per year - includes manning on site (Initiate long-term screw trapping of White River)	Unrated	Unknown
44	Non-Capital	Outreach and Education	Communications/ Public Outreach Support	This project includes technical help to coordinate public education and outreach between the numerous agencies and organizations working in the watersheds. A significant effort would be placed in web-based access to actions, opportunities and goals.	Unrated	Unknown
45	Non-Capital	Outreach and Education	White River Watershed Stewardship Program	Enforcement, education, engineering (according to Forest Plan) dos and don'ts on recreation in habitat areas. Providing aquatic conservation education services to Forest recreators alongs sensitive stream sources.	Unrated	Unknown
46	Capital	Acquisition	Alward Road Acquisition and Planning	Pierce County owns several parcels along Alward Road and would like to purchase more properties in order to setback the existing levee and improve fish habitat. A groundwater channel t would be an interim habitat improvement measure until we own enough property to set the levee back.	1	Degraded Habitat-Channel Structure and Complexity, Degraded Habitat-Floodplain Connectivity and Function, Degraded Habitat-Riparian Areas and LWD Recruitment, Degraded Habitat-Water Quality
47	Capital	Acquisition/ Restoration	Matlock Farms Development Rights Purchase and In Stream Restoration	The goal of this project is to conserve this 155 acre property with 3,000 linear feet of Puyallup River frontage along the property. Ball Creek cuts through the property.	2	Unknown
48	Capital	Acquisition/ Restoration	Big Dog Floodplain Acquisition/ Restoration	This project will acquire 36 acres of prime South Prairie Creek floodplain habitat for salmon conservation. Large Japanese Knotweed monocultures on the property will be eradicated and the property will be fully restored as forested riparian habitat. This property ranked #4 on the CLC South Prairie Creek Action Plan (2002).	1	

	G	H	I	J	K	L	M	N	O
	Habitat Type	Activity Type and Project Performance	Primary Species Benefiting	Secondary Species Benefiting	Current Project Status	Likely Sponsor	Total Cost of Project	Source of funds (PSAR, SRFB, other)	Project ID
1	Estuary (River Delta)	Floodplain Reconnection: Floodplain Reconnection (30.00 Acres)	Chinook	Chum (Secondary Species), Coho (Secondary Species), Pink (Secondary Species), Bull Trout (Secondary Species), Steelhead	In communication with sponsor	NRDA - Jason Latoh	8500000	SRFB - Salmon Recovery Funding Board, Pierce County	10-LowPuy-02
2	Riparian, Instream, Upland		Chinook	Chum (Secondary Species), Cutthroat (Secondary Species), Coho (Secondary Species), Pink (Secondary Species), Bull Trout	Conceptual	Forterra, Pierce Co Water Programs Div	800000		10-SPrairie-02
3	Riparian, Upland		Chinook	Chum (Secondary Species), Cutthroat (Secondary Species), Coho (Secondary Species), Pink (Secondary Species), Bull Trout	Conceptual	King County	6000000	SRFB - Salmon Recovery Funding Board, King County	10-White-05
4	Riparian, Instream, Upland	Activity Type - Acquisition/Easements/Leases : Land, wetland or estuarine area protected from degradation or development (40.00 Acres), Activity Type - Acquisition/Easements/Leases : Streambank or riparian protected (2.64 Miles), Activity Type - Acquisition/Easements/Leases - Washington: Upland protected (40.00 Acres)	Chinook	Coho (Secondary Species), Chum (Secondary Species), Pink (Secondary Species), Steelhead (Secondary Species)	Conceptual		1500000	SRFB - Salmon Recovery Funding Board	10-Hylebos-04
5									

	G	H	I	J	K	L	M	N	O
	Habitat Type	Activity Type and Project Performance	Primary Species Benefiting	Secondary Species Benefiting	Current Project Status	Likely Sponsor	Total Cost of Project	Source of funds (PSAR, SRFB, other)	Project ID
1	Riparian, Instream		Chinook	Steelhead (Secondary Species), Bull Trout (Secondary Species), Coho (Secondary Species), Cutthroat (Secondary Species)	Feasibility Pending	King County	1575000	SRFB - Salmon Recovery Funding Board, King County	10-Boise-02
6	Instream	Activity Type - Instream Habitat: Channel reconfiguration and connectivity: miles (0.36 Miles)	Chinook, Coho, Pink, Steelhead	Sockeye (Secondary Species)	Feasibility Completed	Puyallup Tribe	105059	SRFB - Salmon Recovery Funding Board, Puyallup Tribe	08-2006
7		Activity Type - Fish Passage: Fish passage blockages removed or altered (1.00 Number)	Chinook, Bull Trout, Coho, Pink, Steelhead, Chum	Sockeye (Secondary Species)			80000000		12-5000
8	Nearshore (Embayments), Riparian, Estuary (River Delta)	Activity Type - Estuarine & Nearshore: Shoreline armor removal or modification: miles (0.01 Miles), Activity Type - Estuarine & Nearshore - Washington: Shoreline armor removal or modification (1.00 Feet)	Chinook	Chum (Secondary Species), Coho (Secondary Species), Pink (Secondary Species), Pacific Herring, Sand Lance, Surf Smelt, Steelhead (Secondary Species), Cutthroat	Conceptual, Feasibility Pending	South Puget Sound SEG	2100000	SRFB - Salmon Recovery Funding Board, South Puget Sound SEG, Puget Sound Acquisition and Restoration	12-Marine-01
9									

	G	H	I	J	K	L	M	N	O
	Habitat Type	Activity Type and Project Performance	Primary Species Benefiting	Secondary Species Benefiting	Current Project Status	Likely Sponsor	Total Cost of Project	Source of funds (PSAR, SRFB, other)	Project ID
1									
10	Riparian, Nearshore (Beaches)	Activity Type - Instream Habitat: Streambank stabilization (1.50 Miles)	Chinook	Pacific Herring, Sand Lance, Surf Smelt, Chum (Secondary Species), Coho (Secondary Species), Pink (Secondary Species)	Conceptual, Feasibility Pending	South Puget Sound SEG	400000	SRFB - Salmon Recovery Funding Board, South Puget Sound SEG	12-ChambersBeach-01
11	Instream	Activity Type - Estuarine & Nearshore - Washington: Revegetation (1.00 Sq. Ft.)	Chinook	Coho (Secondary Species), Chum (Secondary Species), Steelhead (Secondary Species)	Conceptual	Washington Department of Fish and Wildlife (WDFW)	3200000		12-Hatchery-01
12	Nearshore (Beaches)	Activity Type - Estuarine & Nearshore: Beach nourishment: acres (1.40 Acres)	Chinook	Chum (Secondary Species), Coho (Secondary Species), Pink (Secondary Species)	Conceptual	Washington Department of Natural Resources (DNR), Pierce County, Puget Creek Restoration Society	1450000	SRFB - Salmon Recovery Funding Board, Pierce County	12-Marine-02
13	Instream	Activity Type - Acquisition/Easements/Leases : Streambank or riparian protected (320.00 Miles), Activity Type - Instream Habitat: Channel reconfiguration and connectivity: miles (0.28 Miles), Activity Type - Riparian Habitat: Planting (2.00	Coho	Coho (Secondary Species)	Conceptual	City of Puyallup			11-Deer-10
14	Nearshore (Beaches), Nearshore (Embayments), Nearshore (Rocky Coast)		Cutthroat, Pink, Sockeye, Steelhead, Chum, Coho, Chinook	Bull Trout (Secondary Species)	Conceptual	South Puget Sound SEG	10000		Watershed-02
15	Riparian, Instream, Upland		Chinook	Coho (Secondary Species)	Design Completed	Earth Corps	750000	private/public	10-Hylebos-05

	G	H	I	J	K	L	M	N	O
	Habitat Type	Activity Type and Project Performance	Primary Species Benefiting	Secondary Species Benefiting	Current Project Status	Likely Sponsor	Total Cost of Project	Source of funds (PSAR, SRFB, other)	Project ID
1	Instream	Activity Type - Fish Screen: Fish screens installed or modified (1.00 Number)	Chinook	Cutthroat (Secondary Species), Coho (Secondary Species), Pink (Secondary Species), Bull Trout (Secondary	Conceptual, Feasibility Completed	Puyallup Tribe, South Puget Sound SEG, Puget Sound Energy	6000000	SRFB - Salmon Recovery Funding Board, Puyallup Tribe, South Puget Sound SEG,	10-UpperPuy-01
16	Rivers/Streams/Shoreline, Nearshore (Beaches), Instream		Chinook	Chinook (Secondary Species)	Conceptual	Puyallup Tribe, South Puget Sound SEG, Al Schmauder	5000		12-Chambers-01
17	Instream		Chinook	Bull Trout (Secondary Species), Chum (Secondary Species), Coho (Secondary Species), Pink (Secondary	Conceptual	Washington Department of Fish and Wildlife (WDFW)	105000	SRFB - Salmon Recovery Funding Board	10-Hatchery-03
18			Chinook				95017	SRFB - Salmon Recovery Funding Board	BoiseRstPln
19	Riparian, Nearshore (Beaches)		Chinook	Coho (Secondary Species), Pink (Secondary Species), Cutthroat (Secondary Species), Pacific Herring, Sand Lance, Surf Smelt	Conceptual		10000000		12-Marine-09
20	Wetland, Instream, Riparian	Activity Type - Floodplain Restoration - Washington: Floodplain acres reconnected (10.00 Acres), Activity Type - Floodplain Restoration - Washington: Miles of levee removed or set back (0.78 Miles), Activity Type - Instream Habitat: Number of structures placed in channel (5.00	Chinook	Bull Trout (Secondary Species), Coho (Secondary Species), Cutthroat (Secondary Species), Pink (Secondary	Conceptual	King County DNR & Parks	20263683	SRFB - Salmon Recovery Funding Board, King County Flood Control District	10-White-02
21									

	G	H	I	J	K	L	M	N	O
1	Habitat Type	Activity Type and Project Performance	Primary Species Benefiting	Secondary Species Benefiting	Current Project Status	Likely Sponsor	Total Cost of Project	Source of funds (PSAR, SRFB, other)	Project ID
22	Nearshore (Beaches), Riparian		Chinook	Chum (Secondary Species), Coho (Secondary Species), Pink (Secondary Species), Pacific Herring, Surf Smelt, Sand Lance,	Conceptual design complete - pending proof of concept - Snohomish County	South Puget Sound SEG	200000	SRFB - Salmon Recovery Funding Board, South Puget Sound SEG	12-Marine-06
23	Instream, Riparian		Coho	Chum (Secondary Species)	Conceptual	Puget Creek Restoration Society	80000	SRFB - Salmon Recovery Funding Board	12-Marine-07
24	Riparian, Estuary (River Delta), Nearshore (Embayments)		Chinook	Chum (Secondary Species), Coho (Secondary Species), Cutthroat (Secondary Species), Pacific Herring, Sand Lance, Steelhead (Secondary Species), Surf Smelt,	Conceptual		10000000		12-Marine-03
25	Nearshore (Beaches), Nearshore (Embayments), Wetland		Chinook	Chum (Secondary Species), Coho (Secondary Species), Pink (Secondary Species), Pacific Herring	Conceptual	South Puget Sound SEG	350000	SRFB - Salmon Recovery Funding Board, South Puget Sound SEG	12-Marine-04
26	Riparian, Instream, Upland, Wetland	Activity Type - Instream Habitat: Channel reconfiguration and connectivity: off-channel stream created (1.00 Miles)	Chinook	Bull Trout (Secondary Species), Coho (Secondary Species), Cutthroat (Secondary Species), Pink (Secondary Species)	Conceptual	Pierce County, City of Puyallup, City of Sumner	171802.52	SRFB - Salmon Recovery Funding Board, Puget Sound Acquisition and Restoration	09-1618

	G	H	I	J	K	L	M	N	O
1	Habitat Type	Activity Type and Project Performance	Primary Species Benefiting	Secondary Species Benefiting	Current Project Status	Likely Sponsor	Total Cost of Project	Source of funds (PSAR, SRFB, other)	Project ID
27						Pierce Co Conservation Dist	30000	SRFB - Salmon Recovery Funding Board, Pierce Co Conservation Dist	SPCRiparian2012
28	Instream, Riparian		Coho	Chum (Secondary Species)	Conceptual		400000		10-LowPuy-01
29	Nearshore (Embayments), Estuary (River Delta), Riparian, Wetland	Activity Type - Fish Passage: Culvert improvements/upgrades (1.00 Number)	Chinook, Chum, Pink	Coho (Secondary Species), Pink (Secondary Species), Chum (Secondary Species)	Feasibility Completed	People for Puget Sound, South Puget Sound SEG, Metro Parks Tacoma	7000000	SRFB - Salmon Recovery Funding Board, Estuary Salmon Restoration Program (ESRP)	12-Marine-11
30	Instream, Riparian, Wetland, Upland	Activity Type - Riparian Habitat: Total riparian area treated: streambank treated (0.40 Miles)	Chinook	Cutthroat (Secondary Species), Coho (Secondary Species), Pink (Secondary Species), Bull Trout (Secondary Species)	Feasibility Completed	King County DNR & Parks	3100000	SRFB - Salmon Recovery Funding Board, King County DNR & Parks	10-White-04
31	Instream		Chinook	Bull Trout (Secondary Species), Chum (Secondary Species), Coho (Secondary Species), Cutthroat (Secondary Species)	SRFB/PSAR Grant round 2013	Pierce Co Conservation Dist	320000		Watershed-04

	G	H	I	J	K	L	M	N	O
	Habitat Type	Activity Type and Project Performance	Primary Species Benefiting	Secondary Species Benefiting	Current Project Status	Likely Sponsor	Total Cost of Project	Source of funds (PSAR, SRFB, other)	Project ID
1									
32	Riparian, Wetland, Upland		Chinook, Bull Trout, Steelhead	Cutthroat (Secondary Species), Coho (Secondary Species), Pink (Secondary Species)	Conceptual	Puyallup Tribe, South Puget Sound SEG, US Forest Service	1500000	SRFB - Salmon Recovery Funding Board, South Puget Sound SEG	10-UpperWhite-01
33	Instream, Riparian, Wetland, Upland, Rivers/Streams/Shoreline	Activity Type - Riparian Habitat: Plant removal/control (270.00 Acres)	Bull Trout, Chinook, Chum, Coho, Cutthroat, Pink, Steelhead	Sockeye (Secondary Species)	Conceptual	Pierce Co Conservation Dist	87262		11-1500
34	Instream, Riparian		Chinook	Coho (Secondary Species), Chum (Secondary Species), Bull Trout (Secondary Species), Pink (Secondary Species), Steelhead (Secondary Species)	Conceptual	King County	75000		Watershed-03
35	Wetland, Upland, Riparian, Rivers/Streams/Shoreline, Instream		Steelhead, Sockeye, Pink, Cutthroat, Coho, Chum, Chinook, Bull Trout	Bull Trout (Secondary Species), Chinook (Secondary Species), Chum (Secondary Species), Coho (Secondary Species)	Conceptual	Pierce County	250000		Watershed-05
36						Pierce Co Conservation Dist	50000	SRFB - Salmon Recovery Funding Board	ChambersEstuary

	G	H	I	J	K	L	M	N	O
	Habitat Type	Activity Type and Project Performance	Primary Species Benefiting	Secondary Species Benefiting	Current Project Status	Likely Sponsor	Total Cost of Project	Source of funds (PSAR, SRFB, other)	Project ID
1									
37	Instream, Rivers/Streams/Shoreline, Estuary (River Delta)		Chinook	Steelhead (Secondary Species)	Conceptual		90000		Monitoring-06
38	Instream		Chinook	Coho (Secondary Species), Chum (Secondary Species), Pink (Secondary Species), Sockeye (Secondary Species), Bull Trout	Conceptual	US Army Corps of Engineers	250000		Monitoring-05
39	Nearshore (Beaches), Nearshore (Embayments), Nearshore (Rocky Coast)		Chinook, Chum, Coho, Cutthroat, Pink, Steelhead, Sockeye	Bald Eagle, Surf Smelt	Conceptual	South Puget Sound SEG	300000		Monitoring-07
40	Instream		Chinook	Coho (Secondary Species), Chum (Secondary Species), Steelhead (Secondary Species)	Conceptual	Washington Department of Fish and Wildlife (WDFW)	450000		Monitoring-04
41	Instream		Chinook	Bull Trout (Secondary Species), Chum (Secondary Species), Pink (Secondary Species), Sockeye (Secondary Species)	Conceptual	Puyallup Tribe	450000	SRFB - Salmon Recovery Funding Board	Monitoring-01
42	Instream		Chinook, Coho, Chum, Steelhead, Pink, Bull Trout	Bull Trout (Secondary Species), Chinook (Secondary Species), Chum (Secondary Species), Pink (Secondary Species)	Conceptual	Muckleshoot Tribe, Puyallup Tribe	450000		Monitoring-03

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	G	H	I	J	K	L	M	N	O
1	Habitat Type	Activity Type and Project Performance	Primary Species Benefiting	Secondary Species Benefiting	Current Project Status	Likely Sponsor	Total Cost of Project	Source of funds (PSAR, SRFB, other)	Project ID
43	Instream		Chinook, Coho, Chum, Bull Trout, Pink, Sockeye, Steelhead	Bull Trout (Secondary Species), Chinook (Secondary Species), Chum (Secondary Species), Coho (Secondary Species)	Conceptual	Muckleshoot Tribe, Puyallup Tribe	450000		Monitoring-02
44	Instream, Estuary (River Delta), Nearshore (Beaches),		Chinook, Chum, Coho	Bull Trout (Secondary Species)	Conceptual	Pierce County	80000		10-Education-02
45	Wetland, Upland, Rivers/Streams/Shoreline, Riparian, Instream		Bull Trout, Chinook, Chum, Coho, Cutthroat, Pink, Steelhead	Sockeye (Secondary Species)	Conceptual	US Forest Service	90000		10-Education-04
46	Instream		Chinook	Chum (Secondary Species), Cutthroat (Secondary Species), Coho (Secondary Species), Steelhead (Secondary Species)	SRFB/PSAR Application 2013	Pierce County SWM	TBD	SRFB - Salmon Recovery Funding Board	10-Alward Rd-13
47	Riparian	Activity Type - Acquisition/Easements/Leases : Land, wetland or estuarine area protected from degradation or development (155.00 Acres), Activity Type - Acquisition/Easements/Leases - Washington: Upland protected	Chinook	Coho (Secondary Species), Chum (Secondary Species), Pink (Secondary Species), Bull Trout (Secondary Species), Steelhead	SRFB/PSAR Application 2013	Forterra	1194000		10-LowPuy-11
48					Actively being pursued	Puyallup Tribe of Indians	150,000		SPC2013b

5.0 RESTORATION ACTIONS

The restoration opportunities and recommended actions presented here were derived from technical studies prepared in support of the Pierce County SMP update or other published reports, or they are based on input provided by County staff, the Shoreline Citizens Advisory Committee, state and federal agencies, Tribes, environmental organizations, and the general public. In compiling the lists of recommended actions for each watershed, the County identified some of the most apparent and significant causes of shoreline degradation and impairment and matched them with the restoration actions (from the menu of restoration actions in Tables 1-1 and 2-1) that would have the greatest opportunity for achieving the goals in Chapter 2.

Additional shoreline restoration opportunities may be present in Pierce County that have not been identified in the tables. Some of the actions identified here may prove to be infeasible or impractical based on further analysis. This list should be used as a starting point for future collaboration and planning.

Programmatic restoration/conservation actions that are applicable to all areas of the County are also identified in this chapter. Implementing the programmatic actions will also help to improve ecological conditions over time.

5.1 PROGRAMMATIC ACTIONS

Certain restoration actions should be broadly and comprehensively implemented on a programmatic basis to help achieve restoration goals. The following programmatic actions are recommended for shorelines within Pierce County. Which County departments or other entities will take the lead on these actions will be determined in the future. Pierce County will continue to coordinate with neighboring jurisdictions on restoration activities. For example, King County and Pierce County have coordinated past restoration and planning efforts, and such coordination is expected to continue. Opportunities to partner with towns and cities in Pierce County on programmatic efforts will also be explored.

Education and Incentives:

- Educate property owners about proper vegetation/landscape maintenance (including preservation of native vegetation along stream/nearshore riparian corridors) to promote shore stabilization and protect water quality.
- Encourage low impact development practices for shoreline property owners.
- Educate private property owners about the negative impacts of shore armoring and over-water structures and encouraging soft shore protection where shore protection is unavoidable.
- Educate boaters about proper waste disposal methods, anchoring techniques, and other best boating practices to minimize habitat damage and prevent water quality contamination.

- Encourage incentive programs for shoreline property owners, such as transfer or purchase of development rights and tax incentives for shoreline restoration and protection.
- Where shorelines have been modified, provide incentives to encourage redevelopment activities to include salmonid habitat restoration.

Marine Nearshore:

- Remove armoring and bulkheads from publicly owned marine sites including parks, wherever feasible.
- Design overwater structures to allow light penetration for protection of aquatic habitat.
- Encourage removal of creosote pilings, docks or other contaminants or derelict structures from the nearshore environment.
- Remove derelict vessels from nearshore areas.
- Work with the shellfish aquaculture industry, Tribes, and non-government organizations to develop and implement BMPs for environmentally sustainable aquaculture.
- Encourage dike and tide gate removal.
- Remove blockages to small tributaries to the nearshore such as culverts, fill and structures.
- Encourage the construction of joint-use versus single-use docks to minimize the need for new dock construction.

Freshwater Shorelines (Lakes and Rivers):

- Remove armoring and bulkheads from publicly-owned freshwater sites including parks, wherever feasible.
- Design docks and piers to allow light penetration for protection of aquatic habitats.
- Encourage the construction of joint-use versus single-use docks to minimize the need for new dock construction.
- Encourage lake associations or stewardship organizations to act for the protection of water quality and control of invasive aquatic weeds in freshwater lakes.
- Encourage levee setback projects to allow for channel migration on rivers and provide off-channel habitat for salmonids.
- Remove culverts and blockages from smaller tributaries and replace with bridges to allow for fish passage and channel migration.

- Restrict new development in the floodplain and channel migration zone.

Infrastructure:

- Manage water withdrawals to address in-stream flows, especially in water-limited basins.
- Implement best management practices to control runoff from agricultural lands.
- Inspect, maintain, and repair leaking or unauthorized septic systems to prevent nutrient and bacteria loading in streams and bays. Where possible, public sewer systems should be installed to replace on-site septic systems.
- Reforest commercial forest lands and repair or abandon forest roads.
- Retrofit stormwater systems using Low Impact Development (LID) strategies.

Planning and Coordination:

- Match mitigation, including off-site and compensatory mitigation, to appropriate restoration and enhancement activities as identified in salmon recovery, watershed management plans and the SMP restoration plan.
- Coordinate SMP restoration with salmonid recovery and watershed management plans to align with projects prioritized in salmon recovery plans.
- Develop a marine resource committee to achieve the protection and restoration of the marine resources of Pierce County (as provided in Chapter 36.125 RCW).
- Continue to survey and monitor invasive species, including noxious weeds and nonnative invertebrates (e.g., tunicates), and initiate eradication programs as needed.

5.2 RESTORATION OPPORTUNITIES - WRIA 10

Restoration opportunities for nearshore areas and freshwater shorelines of the Puyallup-White Rivers (WRIA 10) are summarized in this section. The recommendations are described relative to the benefits they would help to achieve. Implementing these recommendations would complement the protection efforts encompassed in the SMP. Both protection and restoration efforts are necessary to offset impacts of existing and future development, repair past damages, and improve the ecological baseline.

5.2.1 Nearshore Restoration

The nearshore areas of the Puyallup-White Rivers (WRIA 10) are located in Commencement Bay within the urban growth boundary of the City of Tacoma. Tacoma is currently identifying nearshore restoration opportunities within Commencement Bay along with partners, Citizens for a Healthy Bay, Tahoma Audubon Society, Port of Tacoma, the Puyallup Tribe, and others. Tacoma has summarized restoration opportunities for the bay in its City of Tacoma Shoreline Restoration Plan (ESA, April 2011). Partnering with the City of Tacoma and other stakeholders will be important for restoration opportunities within the Brown's Point/Dash Point shorelines in Pierce County jurisdiction.

Restoration in the nearshore marine environment of Commencement Bay has occurred over the past 15 to 20 years through the remediation efforts under the Commencement Bay Natural Resource Damage Assessment (CB/NRDA) program. These efforts are part of the implementation of the Commencement Bay Conceptual Restoration Plan (June 1997), which details the restoration components outlined in the preferred alternative – the Integrated Approach – as described in the programmatic Environmental Impact Statement (EIS) prepared for the Commencement Bay cleanup plan.

Restoration opportunities for Browns Point/Dash Point nearshore shoreline include: 1) removal of intertidal fill, contaminated sediments, creosote contaminated logs, pilings and debris; 2) bulkhead removal or softening; 3) restoration of stream estuaries; and 4) riparian enhancement to improve large woody debris (LWD) recruitment and habitat conditions.

Washington State Parks has recently completed a planning process for Dash Point State Park. Part of the management approach for the park includes restoration measures, such as removing marine debris, addressing permitted surface runoff, restoring stream and intertidal habitat for juvenile salmon, removing facilities to allow natural stream processes to occur, and protecting and monitoring wetlands (WSPRC, 2009).

5.2.2 Freshwater Restoration

The freshwater shoreline restoration opportunities include both programmatic and project-specific actions that have been identified by various government and non-government entities. These are summarized in Table 5-1. Restoration of freshwater shorelines in the Pierce County portion of WRIA 10 will involve coordination with several adjacent jurisdictions that share the shorelines of larger water bodies. Opportunities for partnerships with other local jurisdictions are described by water body in Table 5-1.

Some rivers and lakes do not have site-specific identified restoration opportunities. For example, data are lacking for rivers and streams in the upper watershed in the Mt. Baker-Snoqualmie National Forest or on private forest resource lands.

Restoration opportunities in Table 5-1 are presented first for major streams and rivers, followed by smaller tributaries grouped by drainage basin. All of the projects listed in the table are considered to have a high potential for success in improving the functions of shorelines in the WRIA. However, the success of each restoration project depends on the ultimate project design and implementation.

Table 5-1 lists the recommended timing for each restoration opportunity as “short-term” or “long-term.” **Short-term** (approximately 1-5 years) restoration projects include those that could be implemented by local landowners and volunteers and that would benefit the areas that are most in need. Short-term restoration efforts include habitat restoration and enhancement efforts in publicly owned areas of the County’s shorelines. These projects could be implemented in the near term, depending on grant cycles and coordination with volunteer and community organizations. **Long-term** (approximately 5-10 years) restoration projects could be those that require coordination with other jurisdictions or that cover larger land areas. These projects may be more difficult to implement and would likely require more planning and permitting.

Table 5-1. Freshwater Restoration Opportunities in Puyallup-White River Drainage (WRIA 10)

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Hylebos Creek	High fecal coliform levels; loss of riparian vegetation; loss of estuarine marsh at the mouth. Coordination with Port of Tacoma, City of Tacoma and NRDA plan.	Numerous potential sites along stream. Determine project locations through coordination with other groups that are working on the stream.	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> • Restore stream channel and floodplain to benefit salmon habitat. • Improve flood storage and capacity. • Improve water quality (Hylebos Browns-Dash Point Basin Plan CIP04-LH1-RST01). • Coordinate restoration with Cities of Tacoma and Milton. <p><u>Site-specific opportunities:</u></p> <ul style="list-style-type: none"> • Restoration of NRDA alternative site. Construct 2 acres of new restoration area in the intertidal zone (Port of Tacoma). Included in WRIA 10/12 Lead Entity 2011 Three-year Work Plan. • Restore property owned by WSDOT at the mouth of the Hylebos. Revegetation of tidal area to encourage marsh habitat development (Friends of the Hylebos). Included in WRIA 10/12 Lead Entity 2011 Three-year Work Plan. • Revegetation of the Hauff Property at mouth of Hylebos (Friends of the Hylebos). Included in WRIA 10/12 Lead Entity 2011 Three-year Work Plan. 	High for all opportunities	Water quality Shading and organic input Estuarine habitat Flood storage	<p>Long-term for programmatic opportunities</p> <p>Short-term for site specific opportunities and those listed in basin plan; property acquisition may be long-term</p>

Table 5-1 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Clarks Creek	Non-point source pollution from stormwater runoff, invasive species. Brazilian elodea infestations result in lowered dissolved oxygen, restricted stream flow, retention of sediment, and destruction of fish spawning beds. Infestations are removed annually. Portions of the stream that are well-shaded and free of sediment do not have elodea.	Entire stream where riparian vegetation is lacking. Lower Clarks Creek (CLAR_CR_01)	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> Develop a detailed riparian planting plan for Clarks Creek to increase shading and reduce sedimentation. Coordinate with City of Puyallup. <p><u>Site-specific opportunities:</u></p> <ul style="list-style-type: none"> Enhance floodplain between Pioneer Way and Clear Creek confluence by removing invasive vegetation and planting native vegetation (Clear/Clarks Creek Basin Plan CIP03-CK-RST-01). This is also identified as an opportunity in the Puyallup draft SMP restoration plan (ESA Adolfson, 2007). Implement stormwater retrofit projects funded through Ecology grant (construction anticipated in 2012-2013). Acquire properties that are repeatedly flooded by backflows from Puyallup River at RM 5.8. Identified as an option during flood hazard management plan update (Pierce County Public Works, 2011). 	High for all opportunities	Water quality Fish habitat Shading and organic input	<p>Long-term for programmatic opportunities</p> <p>Short-term for site specific opportunities and those listed in basin plan; property acquisition may be long-term</p>
Clear Creek	See Puyallup River.	Lower Clear Creek (within PUYA_RV_01)	<p><u>Site-specific opportunities:</u></p> <ul style="list-style-type: none"> Restore 3,000 feet of Clear Creek near Pioneer Way by removing invasive vegetation, planting native conifers, installing LWD within channel (Clear/Clarks Creek Basin Plan CIP03-CL-RST-01). Clear Creek restoration planned for scoping in 2011, construction in 2013 (Puyallup River Watershed Council). Acquire floodprone properties at Puyallup River confluence (RM 2.9). Identified as an option during flood hazard management plan update (Pierce County Public Works, 2011). 	High for all opportunities	Shading and organic input Fish habitat	Short-term for site specific opportunities and those listed in basin plan; property acquisition may be long-term

Table 5-1 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Puyallup River	Conversion of forest land cover to pasture or urban land uses; confinement of the channel and disconnection of floodplain by extensive levees and revetments; channel avulsion of the White River into the Puyallup, potentially doubling the sediment load in the lower Puyallup; relocation of the main channel and reduction in channel length; historical dredging of the channel to remove sediment; discharges from wastewater treatment plants; alterations of natural flow regime from upstream dams; loss of riparian forests and sources of LWD; blockage of fish passage by culverts; water quality impairments; road and utility crossings.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Implement streamside and riparian plantings including reforestation of riparian areas behind the levees. Preserve and restore aquatic and terrestrial habitat. Fix culverts that are barriers to salmon. Set back levees and reconnect floodplain habitats. Restore off-channel habitats. Coordinate restoration efforts with Cities of Puyallup, Tacoma, Fife, Sumner, and Orting. 	High for all opportunities	Channel migration and floodplain connection Aquifer recharge Flood flow retention Upland sediment generation Water quality Fish and wildlife habitat Fish passage Shading and organic input	Long-term for programmatic opportunities
		Two priority sites from the WRIA 10/12 priority projects list: South Fork site RM 17.8 – 18.4; Union Pacific Site in estuary RM 2.6-3.0. RM 0 to RM 6	<u>Site-specific opportunities:</u> <ul style="list-style-type: none"> Construction of levee setbacks for floodplain reconnection and habitat restoration between RMs 6 and 22; feasibility study evaluated 20 potential projects on the Puyallup River (Geoengineers 2008). Restore off-channel estuarine habitat on lower Puyallup. Revegetate wetlands in riparian zone. Work with City of Tacoma to implement projects identified in their draft SMP restoration plan (ESA Adolfson, 2011). 	High for all opportunities	See programmatic opportunities	Short-term for site specific opportunities and those listed in basin plans and WRIA project lists; property acquisition may be long-term

Table 5-1 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Puyallup River, (continued)		Lower Puyallup River near SR 512.	<ul style="list-style-type: none"> Revegetate riparian areas and reconnect floodplain wetlands to provide off-channel fish habitat. Coordinate with City of Puyallup to implement projects identified in its draft restoration plan (ESA Adolfson 2007). 	High for all opportunities	See programmatic opportunities	Short-term for site specific opportunities and those listed in basin plans and WRIA project lists; property acquisition may be long-term
		Lower Puyallup	<ul style="list-style-type: none"> North Levee Road setback: Set back levee on right bank from RM 2.4 – 8.1 and purchase affected properties. Identified as an option during flood hazard management plan update (Pierce County Public Works, 2011). Breach, remove, and/or set back levee at Linden Golf Course (RM 9.8 – 10.3). Identified as an option during flood hazard management plan update (Pierce County Public Works, 2011). 			
		Middle Puyallup	<ul style="list-style-type: none"> Calistoga Oxbow Culvert Replacement: Replace undersized and damaged culvert along Puyallup at RM 18 and Calistoga Bridge near Orting to increase backwater rearing habitat and reconnect floodplain (Pierce Co. and Puyallup Tribe). Puyallup River Setback Levee at South Fork (RM 17.8 to 18.4): Complete project to remove existing levee and construct setback levee along 0.6 miles of Puyallup River on the left bank. Will reconnect 45 acres of floodplain and reestablish natural riverine processes. Included in WRIA 10/12 Lead Entity 2011 Three-year Work Plan. 	High for all opportunities		
			<ul style="list-style-type: none"> Levee setback at McCutcheon Rd/128th Street East: Set back levee at RM 16.7-17.3 and acquire floodprone properties. Identified as an option during flood hazard management plan update (Pierce County Public Works, 2011). 			

Table 5-1 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
White River Mud Mountain Lake	Alteration of the natural flow regime by Mud Mountain dam and diversion of surface flows to Lake Tapps (PSE diversion); conversion of forests to harvested forest, pasture, or urban lands; loss of riparian forests; increased demands on groundwater which have increased low flows; land use that have increased fine sediment loads; extensive levees on lower reaches; water quality impairments.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> • Decommission roads in Upper White-Greenwater River floodplain (included in WRIA 10/12 2011 priority projects list). • Install engineered logjams. • Plant riparian vegetation. • Set back levees to allow more channel migration and reconnect floodplain habitat. • Coordinate restoration efforts on the White River with those of the Cities of Sumner, Pacific, and Buckley and King County. 	High for all opportunities	Water quality Fish habitat Shading and organic input Channel migration and floodplain connection	Long-term

Table 5-1 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
<p>White River Mud Mountain Lake (continued)</p>			<p><u>Site-specific opportunities:</u></p> <ul style="list-style-type: none"> • Construction of levee setbacks for floodplain reconnection and habitat restoration. Feasibility study evaluated six potential projects on the White River (Geoengineers 2008). • Sumner Levee Setback: Set back levee between RM 3.2 and RM 3.5 to restore 9 acres of floodplain habitat. Listed in WRIA 10/12 Lead Entity 2011 Three-year work plan. • Transcanada Setback Levee (RM 8.4 – 8.8). Modify existing breaches and remove portions of levee on King County owned property to improve potential for overbank flow into existing side-channels. Listed in WRIA 10/12 Lead Entity 2011 Three-year work plan. • Acquire properties, set back levees, restore riparian vegetation on parcels in Pacific. Listed in WRIA 10/12 Lead Entity 2011 Three-year work plan. • White River Land Acquisition: Acquire up to 300 acres along White River in the vicinity of Buckley. Lands currently owned by PSE and contain important riverine riparian habitats (Pierce County Water Programs, Cascade Land Conservancy and King County). • Levee setbacks (RM 1.8 – 4.4): Acquire properties and set back levees to increase channel capacity and flood storage. Identified as an option during flood hazard management plan update (Pierce County Public Works, 2011). • Acquire property and set back levees at RM 5.2 to restore 47 acres of floodplain habitat. Parcels are located in King and Pierce Counties. • Raise SR 410 and install engineered log jams (RM 43.5 – 43.8). Identified as an option during flood hazard management plan update (Pierce County Public Works, 2011). 	<p>High</p>	<p>See programmatic opportunities</p>	<p>Short-term for site specific opportunities and those listed in basin plans and WRIA project lists; property acquisition may be long-term</p>

Table 5-1 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
South Prairie Creek (continued)		Lower South Prairie Creek	<u>Site-specific opportunities:</u> <ul style="list-style-type: none"> Acquire 60 – 120 acres of instream and riparian habitat along lower south Prairie Creek to protect important salmonid spawning area (included in WRIA 10/12 2011 priority projects list). Acquisition of floodprone properties along lower South Prairie Creek was identified as an option during flood hazard management plan update (Pierce County Public Works, 2011). Instream and riparian restoration (LWD placement, removal of riprap, revegetation) on 300 acres from RM 2 – RM 4.6. Included in WRIA 10/12 Lead Entity 2011 Three-year Work Plan. Survey and control Japanese knotweed in riparian and floodplain areas from RM 0 – RM 10. Included in WRIA 10/12 Lead Entity 2011 Three-year Work Plan. 	High	See programmatic opportunities	Short-term for site specific opportunities and those on WRIA project lists; property acquisition may be long-term
Greenwater River	Timber harvest, logging roads and potential associated sedimentation; water quality impairment.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Place LWD in stream. Remove roads and restore floodplain habitat. Decommission roads in Upper White-Greenwater River floodplain (included in WRIA 10/12 2011 priority projects list). 	High for all opportunities (important fish habitat)	Water quality Fish and wildlife habitat Channel migration and floodplain connection Shading and organic input	Long-term for programmatic opportunities
Clearwater River	Timber harvest, logging roads and potential associated sedimentation; water quality impairment.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Place LWD in stream (included in WRIA 10/12 Lead Entity 2011 Three-year work plan). Remove roads and restore floodplain habitat. Revegetate riparian areas. 	High for all opportunities	Water quality Fish and wildlife habitat Channel migration and floodplain connection Shading and organic input	Long-term
Mid Puyallup River Basin Tributaries						
Fennel Creek	Upper reaches degraded by historic land uses, lack of riparian vegetation and LWD. Riparian area south of Sumner-Buckley Hwy is still relatively intact.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Revegetate riparian areas, particularly in upper portions of SMP planning area. Coordinate restoration efforts with City of Buckley. 	High for all opportunities	Water quality Shading and organic input Fish and wildlife habitat Wetland restoration	Long-term

Table 5-1 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Rhodes Lake	Shoreline armoring, docks, removal of shoreline vegetation.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore native shoreline vegetation. Remove failing bulkheads. Replace failing bulkheads with softer alternatives. 	High for all opportunities	Water quality Shading and organic input Fish and wildlife habitat Wetland restoration	Long-term
Upper Puyallup River Basin Tributaries						
Kapowsin Creek	Livestock access to stream; lack of riparian vegetation in some areas.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Fence livestock areas to prevent access to stream. Revegetate riparian areas. 	Moderate for all opportunities	Water quality Shading and organic input Fish and wildlife habitat	Long-term
Kapowsin Lake	High phosphorus levels, timber harvest, limited residential docks and bulkheads.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Protect existing shoreline vegetation and replant where vegetation is lacking. 	Moderate for all opportunities	Water quality Shading and organic input Fish and wildlife habitat	Long-term
Morgan Lake	Removal of vegetation for agriculture and low-density residential development.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Revegetate degraded wetland areas. Enhance shoreline riparian vegetation. 	Moderate to High for all opportunities	Water quality Shading and organic input Fish and wildlife habitat	Long-term
<i>Tributaries in Forest Resource Areas:</i> Ohop Creek Kings Creek Neisson Creek Mowich River Rushingwater Creek Meadow Creek Deer Creek North Puyallup River South Puyallup River Saint Andrews Creek Unnamed Tributary to Puyallup River Unnamed Tributary to South Puyallup	Timber harvest, logging roads and potential associated sedimentation.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Decommission or repair logging roads to prevent sedimentation into water bodies. Replant riparian zones with native trees. Remove failing culverts. Add LWD to stream channels where appropriate. 	High for all opportunities (sediment transport)	Water quality & Sediment Transport Shading and organic input Fish and wildlife habitat	Long-term
Lower White River Basin Tributaries						
Leaky Lake	Residential bulkheads, docks.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore native shoreline vegetation. Replace failing bulkheads with softer alternatives. 	Moderate for all opportunities	Water quality Shading and organic input Fish and wildlife habitat	Long-term

Table 5-1 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Upper White River Basin Tributaries						
<i>Tributaries in Forest Resource Areas:</i> Canyon Creek Two Milky Creek West Fork White River Pinochle Creek Viola Creek Huckleberry Creek Eleanor Creek Lost Creek (Huckleberry) Silver Creek Goat Creek Twenty-eight Mile Creek George Creek Lost Creek (Greenwater) Maggie Creek Echo Lake	Timber harvest, logging roads and potential associated sedimentation.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Decommission or repair logging roads to prevent sedimentation. Replant riparian zones with native trees Road decommissioning in floodplains specifically for Huckleberry and West Fork White River (including re-contouring of slope, installation of water barrs, removal of culverts or drainage structures, and revegetation). (USFS, SPSSEG, Puyallup Tribe; Lead Entity WRIA 10/12 Priority project). Add LWD to stream channels where appropriate. 	High for all opportunities	Water quality Shading and organic input Fish and wildlife habitat Channel migration and floodplain connection	Long-term for programmatic opportunities Short-term for site specific opportunities and those on WRIA project lists
South Prairie Creek Basin Tributaries						
Wilkeson Creek	Water quality impairment; loss of riparian vegetation.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Revegetate riparian areas. 	High for all opportunities	Water quality Shading and organic input Fish and wildlife habitat	Long-term
<i>Tributaries in Forest Resource Areas:</i> Gale Creek Page Creek East Fork South Prairie Creek South Fork South Prairie Creek	Timber harvest, logging roads and potential associated sedimentation; water quality impairment.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Decommission or repair logging roads to prevent sedimentation. 	High for all opportunities	Water quality	Long-term
Lower Carbon River Basin Tributaries						
Voight Creek	Removal of riparian vegetation; water quality impairment.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Revegetate riparian areas. 	High for all opportunities	Water quality Shading and organic input Fish and wildlife habitat	Long-term

Table 5-1 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Bear Creek	Timber harvest, logging roads and potential associated sedimentation; water quality impairment.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> • Decommission or repair logging roads to prevent sedimentation. 	High for all opportunities	Water quality Fish habitat	Long-term
Upper Carbon River Basin Tributaries						
<i>Tributaries in Forest Resource Areas:</i> Evans Creek Tolmie Creek Chenuis Creek Cayada Creek	Timber harvest, logging roads and potential associated sedimentation; water quality impairment.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> • Decommission or repair logging roads to prevent sedimentation. • Revegetate riparian areas. 	Moderate for all opportunities (sediment transport)	Water quality Shading and organic input Fish and wildlife habitat	Long-term

Sources: Pierce County Lead Entity WRIA 10/12; Puyallup River Watershed Council; Pierce County Public Works Puyallup River Basin CIP program

5.3 RESTORATION OPPORTUNITIES - WRIA 11

Restoration opportunities for nearshore areas and freshwater shorelines of the Nisqually River (WRIA 11) are summarized in this section. Implementing these recommendations would complement the protection efforts encompassed in the SMP. Both protection and restoration efforts are necessary to offset impacts of existing and future development, repair past damages, and improve the ecological baseline.

5.3.1 Nearshore Restoration

The single most important salmonid habitat restoration project in the Nisqually River Salmon Recovery Plan is currently underway in the Nisqually delta in the Nisqually National Wildlife Refuge area. In a phased approach that began in 2008, the estuary restoration project funded by the U.S. Fish and Wildlife Service has removed much of the outer dike to allow the natural regeneration of estuarine wetland and tidal channels within a 760-acre area on the refuge (<http://www.fws.gov/Nisqually/wildlife/restoration.html>). This project combined with adjacent restoration efforts by the Nisqually Tribe on tribal lands is anticipated to significantly restore habitat for Nisqually Chinook and other salmonids in the Nisqually estuary.

A comprehensive nearshore habitat assessment and restoration design project is currently underway for the WRIA 11 and 12 shoreline areas of the southern Puget Sound region. This project is being led by SPSSEG in cooperation with Nisqually Tribe, Pierce County, People for Puget Sound and the BNSF Railroad Company. In 2006, SPSSEG inventoried habitat from the Nisqually Delta north to Point Defiance to characterize habitats and assess forage fish use. A study is currently underway to identify restoration opportunities and develop a restoration plan specific to this nearshore reach. In addition to identifying restoration projects that will have the greatest benefit to salmon, the WRIA 11/12 Nearshore Assessment fills in data gaps between previously assessed areas adjacent to the project reach. Thurston County conducted a nearshore assessment in the Nisqually River and the Key Peninsula, Gig Harbor and Islands Assessment (KGI Study; Pentec, 2003) covered Anderson and Fox Islands, as well as the Gig Harbor area. The WRIA 11 and 12 nearshore assessment was designed consistent with these adjacent assessments, and gained consistency with other assessments in Puget Sound by following the Puget Sound Nearshore Partnership's guidance (PSNERP 2002). The nearshore restoration project is not yet complete and the summary report is not yet available to the public <http://www.spsseg.org/index.php/projects/habitat-assessment/wria-1112-nearshore-assessment/>.

5.3.2 Freshwater Restoration

The freshwater shoreline restoration opportunities include both programmatic and project-specific actions that have been identified by various government and non-government entities. These are summarized in Table 5-2. Restoration of freshwater shorelines in the Pierce County portion of WRIA 11 will involve coordination with several adjacent jurisdictions that share the shorelines of larger water bodies. Opportunities for partnerships with other local jurisdictions are described by water body in Table 5-2.

Some rivers and lakes do not have site-specific identified restoration opportunities. For example, data are lacking for many of the small lakes in the basin. Restoration opportunities in Table 5-2 are presented first for major streams and rivers, followed by smaller tributaries grouped by

drainage basin. All of the projects listed in the table are considered to have a high potential for success in improving the functions of shorelines in the WRIA. However, the success of each restoration project depends on the ultimate project design and implementation.

Table 5-2 lists the recommended timing for each restoration opportunity as “short-term” or “long-term.” **Short-term** (approximately 1-5 years) restoration projects include those that could be implemented by local landowners and volunteers and that would benefit the areas that are most in need. Short-term restoration efforts include habitat restoration and enhancement efforts in publicly owned areas of the County’s shorelines. These projects could be implemented in the near term, depending on grant cycles and coordination with volunteer and community organizations. **Long-term** (approximately 5-10 years) restoration projects could be those that require coordination with other jurisdictions or that cover larger land areas. These projects may be more difficult to implement and would likely require more planning and permitting.

Table 5-2. Freshwater Restoration Opportunities in Nisqually River Drainage (WRIA 11)

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Nisqually River	Conversion of forests to military reservation, harvested forest, and agriculture; confinement of the channel and disconnection of the floodplain with levees or revetments; sediment reduction downstream of two hydroelectric projects; gravel mining activities; water diversion; and water quality impairment, largely from agricultural activities.	<p>All reaches</p> <p>Lower mainstem areas (NISQ_RV_01, 02, 03)</p> <p>Wilcox area (NISQ_RV_01 and 02)</p> <p>NISQ_RV_02</p>	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> Remove culverts blocking salmon passage and altering sediment processes in tributaries to the Nisqually. Restore forested conditions in degraded areas of the riparian zone. Protect feeder tributaries from sedimentation due to timber harvest, gravel mining, and other development. Control knotweed in riparian buffers and floodplains of salmon-bearing streams. Support ongoing tribal, government, and non-profit organization restoration programs throughout watershed. Coordinate restoration efforts with Thurston County; for example, removal of invasive vegetation and replanting of native species in riparian areas. <p><u>Site-specific opportunities:</u></p> <ul style="list-style-type: none"> Acquire shoreline properties that are important to protecting riparian functions and channel migration zones (Nisqually River Basin Plan CIP11-NIS-AC02, AC03). Create side channel fish habitat, reconnect existing off-channel habitats by restoring the channel migration zone, enhance riparian vegetation on Wilcox Flats (Nisqually River Basin Plan CIP11-NIS-RST01, CIP11-NIS-RST02, CIP11-NIS-RST03). Numerous property acquisition and restoration projects planned in Wilcox flats area; included in WRIA 11 Lead Entity 2011 Three-year work plan. 	High for all opportunities (important salmonid habitat)	<p>Fish and wildlife habitat</p> <p>Water quality</p> <p>Shade and organic input</p> <p>Floodplain connection and channel migration</p>	<p>Long-term for programmatic opportunities</p> <p>Short-term for site specific opportunities and those in basin plans and WRIA project lists; property acquisition may be long-term</p>

Table 5-2 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Nisqually River (continued)		McKenna area (RM 21.6 – 22.0) Nisqually Park Subdivision (RM 65.0)	<ul style="list-style-type: none"> Acquire floodprone properties (Pierce County Public Works, 2011). McKenna protection project – acquire 250+ acres including Nisqually mainstem riparian areas and McKenna Creek headwater wetlands (included in WRIA 11 Lead Entity 2011 Three-year work plan). Acquire property and install engineered log jams (Pierce County Public Works, 2011). 	High	See programmatic opportunities	
Mashel River	Channelization of river; removal of riparian vegetation; lack of LWD.	All reaches Mashel River in and near Eatonville (MASH_RV_02, 03)	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> Restore forested riparian areas. Restore LWD to stream Decommission/resurface timber roads, replace culverts. Coordinate restoration efforts with Town of Eatonville. <p><u>Site-specific opportunities:</u></p> <ul style="list-style-type: none"> Acquire river shoreline and adjacent upland properties that are a priority for restoration (Nisqually River Basin Plan CIP20-MAL-AC01 and AC02). Middle Mashel Riparian Enhancement – restore degraded riparian areas currently in timber production (included in WRIA 11 Lead Entity 2011 Three-year work plan). 	High (important fish habitat)	Fish and wildlife habitat Water quality Shade and organic input	<p>Long-term for programmatic opportunities</p> <p>Short-term for site specific opportunities and those in basin plans and on WRIA project lists; property acquisition may be long-term</p>

Table 5-2 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Mashel River (continued)		Mashel River near Eatonville	<ul style="list-style-type: none"> Acquire 105 acres to support and expand the Mashel River Eatonville Reach Instream Restoration Project, including 70 acres at the confluence with the Little Mashel River (included in WRIA 11 Lead Entity 2011 Three-year work plan). Acquire and protect 313 acres on Mashel River near Boxcar Canyon (included in WRIA 11 Lead Entity 2011 Three-year work plan). 	High	See programmatic opportunities	
Little Mashel River	Channelization of river; removal of riparian vegetation.		<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> Restore forested riparian areas. Protect and restore associated wetlands. Restore natural channel configuration. Coordinate restoration efforts with Town of Eatonville. <p><u>Site-specific opportunities:</u></p> <ul style="list-style-type: none"> Acquire 45 acres of riparian and floodplain habitat near the Little Mashel confluence with the Mashel River (Nisqually Land Trust/Pierce County project listed in 2008 South Puget Sound 3-Year Project List). 	Moderate	Fish and wildlife habitat Water quality Shade and organic input Floodplain connection and channel migration	<p>Long-term for programmatic opportunities</p> <p>Short-term for site specific opportunities and those on WRIA project lists; property acquisition may be long-term</p>

Table 5-2 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Tanwax Creek	Increased erosion and inputs of fine sediment associated with agricultural activities; areas of stream channelization and loss of habitat complexity; loss of riparian forests above RM 6.5; and degraded wetlands dominated by reed canarygrass below RM 6.5. Water quality impairments include fecal coliform, temperature, and dissolved oxygen.	Tanwax Creek (TANW_CR_01)	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> • Protect and restore wetlands that maintain flow in Tanwax Creek. • Control invasive reed canarygrass • Remove existing ditches and drains in wetlands to restore hydrology. • Plant native trees and shrubs. • Plant native trees and shrubs along Tanwax Creek above RM 6.5. • Restore original channel morphology in channelized sections. (Nisqually River Basin Plan CIP11-TWL-RST01, CIP11-TWU-AC01 and AC02). • Support Nisqually Tribe restoration projects. <p><u>Site-specific opportunities:</u></p> <ul style="list-style-type: none"> • Acquire and restore riparian habitat along lower Tanwax Creek and confluence with Nisqually River (included in WRIA 11 Lead Entity 2011 Three-year work plan). 	Moderate to High	Fish and wildlife habitat Shading and organic input Stream base flows Wetland hydrology Water quality	<p>Long-term for programmatic opportunities</p> <p>Short-term for site specific opportunities and those in basin plans; property acquisition may be long-term</p>
Muck Creek	Loss of riparian forest cover, with resulting increase in temperatures and lack of LWD; increasing intermittent/low flows result in significant impact on fish passage; sedimentation due to livestock access; channelization with a loss of channel complexity and disconnection from floodplain; non-native species (reed canarygrass) dominance and filling of some smaller channels. Water quality impairments are primarily temperature and fecal coliforms.	All reaches, especially areas with perennial flow; e.g., North Fork between 8 th Ave. East and SR 7 (Muck Creek Basin Plan CIP 12NF-STR-01, 02).	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> • Establish a functional riparian corridor along the stream system through large-scale plantings of riparian vegetation. • Exclude cattle and horses from the stream corridor. • Replace existing culverts where possible to enhance passage. • Remove and manage reed canarygrass where channels are blocked. • Restore forested riparian areas. • Restore degraded wetlands to reestablish forest cover. 	Moderate to High	Fish and wildlife habitat Shading and organic input Water quality	<p>Long-term for programmatic opportunities</p>

Table 5-2 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Ohop Creek	Loss of riparian forest in some reaches with a lack of LWD and high temperatures; downstream of Ohop Lake, channelization and reduced habitat complexity and disconnected the stream from the floodplain. Water quality impairments include fecal coliform, temperature, dissolved oxygen, and pH. The EDT model ranked the lower 6.3 miles of Ohop Creek as among the highest priority tributary reaches for salmonid habitat restoration.	All reaches	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> Restore meanders to the stream, which was historically channelized for agriculture. Restore riparian forests. Replace existing culverts where possible to enhance fish passage. Control invasive reed canarygrass. Restore floodplain wetlands (Nisqually Indian Tribe, 2008; Nisqually Land Trust, 2006). Coordinate restoration efforts with Town of Eatonville. <p><u>Site-specific opportunities:</u></p>	High for all opportunities (important salmonid habitat)	Channel migration and floodplain connection Shading and organic input Fish and wildlife habitat Water quality	Long-term for programmatic opportunities
		Upper part of stream (OHOP_NIS_CR_03)	<ul style="list-style-type: none"> Acquire upper Ohop Creek shoreline reaches that are accessible to anadromous fish and are a priority for restoration (Nisqually River Basin Plan CIP14-OHU-AC01 and AC02). 			Short-term for site specific opportunities and those in basin plans and on WRIA project lists; property acquisition may be long-term
		Lower Ohop Valley (OHOP_NIS_CR_01, 02)	<ul style="list-style-type: none"> Continue implementation of the Lower Ohop Creek Restoration Project to restore 4 miles of meandering stream channel and connection to floodplain, and revegetate 400 acres of wetlands (Nisqually River Basin Plan CIP14-OHL-RST01, RST02, RST03; also included in WRIA 11 Lead Entity 2011 Three-year work plan). Acquire 100 acres along one mile of lower Ohop Creek for permanent protection (included in WRIA 11 Lead Entity 2011 Three-year work plan). 			
		Middle Ohop (RM 4 to Ohop Lake)	<ul style="list-style-type: none"> Revegetate over two miles of riparian area with native trees and shrubs (included in WRIA 11 Lead Entity 2011 Three-year work plan). Acquire conservation easement on 38+ acres in Eatonville UGA to protect Chinook spawning reach (included in WRIA 11 Lead Entity 2011 Three-year work plan). 			

Table 5-2 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Mid Nisqually River Tributaries						
Horn Creek	Lack of forested riparian zone, nutrient inputs from agriculture.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore riparian areas. Protect and restore associated wetlands. Fish passage improvements (CIP11-HRN-FP01, 02). Horn Creek fish passage project is also included in the 2008 South Puget Sound 3-Year Project List. 	Moderate	Shading and organic input Fish and wildlife habitat	Long-term for programmatic opportunities Short-term for site specific opportunities in CIP list.
Harts Lake	Nutrient inputs from lawn fertilizers, septic systems, and agricultural operations along the shoreline.	All reaches HART_LK_01	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore forested riparian areas. Restore degraded wetlands. Repair septic systems. <u>Site-specific opportunities:</u> <ul style="list-style-type: none"> Restore historic connection between Nisqually mainstem and Harts Lake Creek (listed in 2008 South Puget Sound 3-Year Project List). 	Moderate to High	Water quality Fish and wildlife habitat Shading and organic input	Long-term for programmatic opportunities Short-term for site specific opportunities and those on WRIA project lists

Table 5-2 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
<p><i>Other Lakes:</i> Unnamed Lake near Roy Little Lake Benbow Lake Tanwax Lake Whitman Lake Tule Lake Rapjohn Lake Twin Lakes Kreger Lake Unnamed Lake near Tanwax Silver Lake Cranberry Lake Mud Lake Clear Lake Twenty-seven Lake</p>	Issues common to most of the lakes in this drainage basin include high phosphorus levels; removal of riparian vegetation for residences, agriculture, or other uses; shoreline armoring with docks and bulkheads; alteration of associated wetlands; possible livestock access to shoreline (Cranberry Lake in particular); invasive species.	All reaches	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> Restore forested riparian areas along lake shores and inlet or outlet streams. Restore associated wetlands. Replace/consolidate existing docks to reduce shade impacts. Remove abandoned docks. Replace failing bulkheads with soft alternatives. Protect existing natural shorelines. Prevent livestock access to sensitive shoreline areas. Repair septic systems. 	Moderate to High	Water quality Fish and wildlife habitat Shading and organic input	Long-term
Upper Nisqually River Tributaries						
La Grande Reservoir	Construction of dam; high phosphorous levels.	All reaches	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> Restore riparian vegetation. 	Moderate	Water quality Fish and wildlife habitat Shading and organic input	Long-term
Alder Lake	Construction of Alder Dam; small number of docks and SR 706 running along some of the north shore of the lake; water quality (phosphorus and sediment) due to stormwater runoff from roads, rural residential, forestry, and agricultural areas.	All reaches	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> Restore native riparian vegetation (shrubs and trees) in areas with no or sparse forested riparian buffer and near park/boat launch facilities. 	Moderate	Water quality Fish and wildlife habitat Shading and organic input	Long-term
Copper Creek	Timber harvest, road crossings, sedimentation.	All reaches	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> Restore forested riparian areas. Decommission/resurface timber roads, replace culverts. 	Moderate	Water quality Fish and wildlife habitat Shading and organic input	Long-term

Table 5-2 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Muck Creek Tributaries						
Muck Lake	Removal of riparian vegetation for residences and pasture.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore forested riparian areas and associated wetlands. 	Moderate to High	Water quality Fish and wildlife habitat Shading and organic input	Long-term
South Creek	Removal of riparian vegetation; lack of LWD; ditching and draining of wetlands.	All reaches, especially areas with perennial flow; e.g., South Fork between 8 th Ave. East and SR 7 (Muck Creek Basin Plan CIP 12SF-STR-01, 02).	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore forested riparian areas. Replace culverts to improve fish passage. Control invasive vegetation. 	Moderate to High	Water quality Fish and wildlife habitat Shading and organic input	Long-term
Ohop Creek Tributaries						
Ohop Lake	High phosphorous levels; invasive species; residential docks and bulkheads.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore forested riparian buffers. Revegetate disturbed areas near boat launch and recreation area. Repair failing bulkheads. Replace/consolidate docks to reduce shade impacts. Replace failing bulkheads with soft alternatives. 	Moderate to High	Water quality Fish and wildlife habitat Shading and organic input	Long-term
Lynch Creek Twenty-file Mile Creek	Elevated sediments; removal of riparian vegetation for residences, agriculture, mining.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore forested riparian vegetation and degraded wetlands. Decommission forest roads. Stabilize slopes. Restore mine areas. 	Moderate to High	Water quality Fish and wildlife habitat Shading and organic input	Long-term

Table 5-2 continued.

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Mashel River Tributaries						
Midway Creek South Fork Little Mashel River	Removal of riparian vegetation.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore forested riparian vegetation. 	Moderate	Water quality Fish and wildlife habitat Shading and organic input	Long-term
<i>Tributaries in Forest Resource Areas:</i> Beaver Creek Busy Wild Creek Unnamed Tributary Mashel River	Timber harvest, road crossings, sedimentation.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore forested riparian vegetation. Decommission or repair forest roads and replace culverts. 	Moderate	Water quality Fish and wildlife habitat Shading and organic input	Long-term

Sources: Nisqually Indian Tribe, Nisqually Land Trust, Pierce County Muck Creek Basin Plan, Pierce County Nisqually River Basin Plan, South Puget Sound Salmon Enhancement Group

5.4 RESTORATION OPPORTUNITIES - WRIA 12

Restoration opportunities for freshwater shorelines of the Chambers/Clover Creek Watershed (WRIA 12) are summarized here. No nearshore shoreline areas within Pierce County jurisdiction lie within WRIA 12; however, the County owns Puget Sound shoreline properties located within the jurisdiction of University Place. Implementing these recommendations would complement the protection efforts encompassed in the SMP. Both protection and restoration efforts are necessary to offset impacts of existing and future development, repair past damages, and improve the ecological baseline.

5.4.1 Freshwater Restoration

The freshwater shoreline restoration opportunities for the Chambers/Clover Creek watershed include both programmatic and project-specific actions that have been identified by primarily Pierce County. These are summarized below in Table 5-3. Restoration of freshwater shorelines in the Pierce County portion of WRIA 12 will involve coordination with several adjacent jurisdictions that share the shorelines of larger water bodies. Opportunities for partnerships with other local jurisdictions are described by water body in Table 5-3.

The Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) has identified a project to restore the mouth of Chambers Creek and Chambers Bay. This project would involve properties both within Pierce County shoreline jurisdiction (lower Chambers Creek) and outside of Pierce County jurisdiction (Chambers Bay estuary). The railroad causeway and Chambers Creek dam inhibit the free flow of tidal and fluvial waters. These features, along with shoreline armoring and private development in the estuary, are impacting the natural geomorphic processes that are responsible for creating and maintaining nearshore habitat. Removal of these features will allow for tidal hydrology, the natural transport of sediment, and freshwater inputs across the current and historic Chambers Bay estuary (ESA et al., 2011). This restoration project will involve coordination among PSNERP, Pierce County, University Place, and the Town of Steilacoom. Both Steilacoom and University Place are developing SMP restoration plans for their respective shorelines in this area (ESA and CGS, 2011).

Restoration within this watershed focuses on improvements to water quality, surface water quantities, and recovery of habitats in an urbanized setting. All of the projects listed in the table are considered to have a high potential for success in improving the functions of shorelines in the WRIA. However, the success of each restoration project depends on the ultimate project design and implementation.

Table 5-3 lists the recommended timing for each restoration opportunity as “short-term” or “long-term.” **Short-term** (approximately 1-5 years) restoration projects include those that could be implemented by local landowners and volunteers and that would benefit the areas that are most in need. Short-term restoration efforts include habitat restoration and enhancement efforts in publicly owned areas of the County’s shorelines. These projects could be implemented in the near term, depending on grant cycles and coordination with volunteer and community organizations. **Long-term** (approximately 5-10 years)

restoration projects could be those that require coordination with other jurisdictions or that cover larger land areas. These projects may be more difficult to implement and would likely require more planning and permitting.

Table 5-3. Freshwater Restoration Opportunities in Chambers-Clover Creek Drainage (WRIA 12)

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Chambers Creek	Conversion of forested cover to impervious surfaces, pastures, and residential lawns; bank armoring; numerous physical barriers and crossings, including a fish weir associated with the hatchery at the mouth of Chambers Creek; groundwater extraction which has affected summer time low flows; alterations to flow regime from stormwater runoff; water quality impairments.	All reaches CHAM_CK_01	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> The Chambers-Clover Creek Watershed Council's (CCCWC) action plan for 2007 through 2011 includes restoring streams, wetlands, and riparian areas, restoring beneficial uses of lakes, and supporting salmon recovery efforts (CCCWC, 2007). Coordinate restoration on lower Chambers Creek with adjacent jurisdictions (Lakewood, University Place, and Steilacoom). <u>Site-specific opportunities:</u> <ul style="list-style-type: none"> Continue Pierce County project to identify and control knotweed infestations in Chambers Creek Canyon. Participate in PSNERP project to restore tidal hydrology, sediment transport, and freshwater inputs between Chambers Creek and the estuary. Remove Chambers Creek dam, support buildings, abutment fill material, and impounded sediments behind dam. Replace Chambers Creek Road bridge with full span (ESA et al., 2011). 	High	Water quality Fish and wildlife habitat	Short-term
Clover Creek	Conversion of forest cover to impervious surface, pasture or lawn; bank armoring; physical barriers and crossings; piping large sections of stream through McChord Air Force Base and diversion into asphalt ditch around Pacific Lutheran University; groundwater extraction that has reduced water available for summer flows; large regional detention facilities as well as numerous in-line and off-line private ponds; removal of LWD; invasion by non-native plants; water quality impairments.	All reaches CLOV_CR_01	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore terrestrial and aquatic habitat. Restore riparian forested buffers. Restoring floodplain habitat and reconnect channel and floodplain. Coordinate restoration efforts with City of Lakewood. <u>Site-specific opportunities:</u> <ul style="list-style-type: none"> Remove asphalt lining from streambed and replace it with a clay liner or other measure to reduce flow loss through the channel. Remove invasive vegetation, replant native species, install in-stream habitat features (Clover Creek Basin Plan CIP-WQH-5A, 5B). 	High	Water quality Fish and wildlife habitat Channel migration and floodplain connectivity Stream hydrology Shading and organic input	Long-term for programmatic opportunities Short-term for site specific opportunities and those in basin plans
Spanaway Creek	Conversion of forest cover to impervious surface, pasture or lawn; bank armoring; physical barriers and crossings; groundwater extraction that has reduced water available for summer flows; numerous in-line and off-line private ponds; removal of LWD; invasion by non-native plants; water quality impairments.	SPAN_CR_01; downstream from the Bresemann Dam passage barrier removal project	<u>Site-specific opportunities:</u> <ul style="list-style-type: none"> Remove invasive vegetation and accumulated sediments; install native vegetation; replace hardened embankment with bioengineered bank stabilization measures; install woody debris in the channel (Clover Creek Basin Plan, CIP-WQH-4A, 4B, 4C). 	Moderate	Water quality Fish and wildlife habitat Shading and organic input	Short-term
Spanaway Lake	Loss of forest cover and conversion to impervious surface, residential lawns, and pasture; shoreline armoring; docks and overwater structures; water quality impairments.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Replace bulkheads with softer alternatives where possible. Consolidate/replace docks with alternate decking to reduce shade impacts. Restore forested riparian buffers where possible. 	Moderate	Water quality Fish and wildlife habitat Shading and organic input	Long-term

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
American Lake	Water quality degradation from urban stormwater runoff; loss of riparian habitat along the shoreline; docks/overwater structures and shoreline armoring that reduce shallow littoral and riparian habitats; water quality impairments.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> • Replace bulkheads with softer alternatives where possible. • Consolidate/replace docks with alternate decking to reduce shade impacts. • Restore forested riparian buffers where possible. • Coordinate restoration efforts with City of Lakewood. 	Moderate	Water quality Fish and wildlife habitat Shading and organic input	Long-term

Sources: Chambers-Clover Creek Watershed Council

5.5 RESTORATION OPPORTUNITIES - WRIA 15

Restoration opportunities for nearshore areas and freshwater shorelines of the Kitsap Peninsula and Islands Watershed (WRIA 15) are summarized in this section. Implementing these recommendations would complement the protection efforts encompassed in the SMP. Both protection and restoration efforts are necessary to offset impacts of existing and future development, repair past damages, and improve the ecological baseline.

5.5.1 Nearshore Restoration

Nearshore restoration opportunities have been identified for WRIA 15 through a variety of planning and study efforts. These include the Key Peninsula, Gig Harbor, and Islands Watershed Nearshore Salmon Habitat Assessment (Pentec, 2003), the Draft Chinook and Bull Trout Recovery Approach for the South Puget Sound Nearshore (SPSSRG, 2004), the additional work by the SPSSRG to determine restoration opportunities specifically in Carr Inlet (Kantz, pers. Comm., 2009), and salmon restoration planning efforts for WRIA 15 (West Sound Watersheds Council, 2011). Table 5-4 provides a summary of these restoration opportunity types by nearshore shoreline reach. Table 5-5 provides a detailed list of restoration projects based upon the KGI study and WRIA 15 priorities. Table 5-6 provides management recommendations for Carr Inlet only.

Intact nearshore habitats have also been identified within Pierce County's portion of WRIA 15 (SPSSRG, 2004; Pentec, 2003). These nearshore habitats provide natural shoreline functions and should be protected as important aquatic resources. Intact habitats that should be considered for protection include but are not limited to:

- Carr Inlet – Cutts Island;
- Case Inlet - Head of Rocky Bay;
- WDFW Marine Protected Areas – Colvos Passage;
- Cove between Devil's Head and Taylor Bay;
- Head of Dutcher's Cove;
- Pocket estuaries; sand spits and estuarine marshes; and
- Active coastal feeder bluffs.

The nearshore projects listed in Table 5-5 are likely to be long-term, requiring more than five years to implement. This is due to the permitting complexity and high costs typically associated with nearshore projects.

5.5.2 Freshwater Restoration

The freshwater shoreline restoration opportunities for the Kitsap Peninsula and Islands watershed include both programmatic and project-specific actions that have been identified primarily by

Pierce County through its basin planning process. The freshwater restoration opportunities are summarized below in Table 5-7. Restoration of freshwater shorelines in the Pierce County portion of WRIA 15 will involve coordination with several adjacent jurisdictions that share the shorelines of larger water bodies. Opportunities for partnerships with other local jurisdictions are described by water body in Table 5-7.

Restoration within this watershed focuses on improvements to water quality, surface water quantities, and recovery of habitats. All of the projects listed in the table are considered to have a high potential for success in improving the functions of shorelines in the WRIA. However, the success of each restoration project depends on the ultimate project design and implementation.

Table 5-7 lists the recommended timing for each restoration opportunity as “short-term” or “long-term.” **Short-term** (approximately 1-5 years) restoration projects include those that could be implemented by local landowners and volunteers and that would benefit the areas that are most in need. Short-term restoration efforts include habitat restoration and enhancement efforts in publicly owned areas of the County’s shorelines. These projects could be implemented in the near term, depending on grant cycles and coordination with volunteer and community organizations. **Long-term** (approximately 5-10 years) restoration projects could be those that require coordination with other jurisdictions or that cover larger land areas. These projects may be more difficult to implement and would likely require more planning and permitting.

Table 5-4. Summary of Nearshore Restoration and Protection Opportunities (WRIA 15)

Management Units	Reach Name	Restoration Opportunities					Protection		Source
		Structure/Bulkhead Removal	Stream/Marsh Restoration	Culvert Maintenance/ Replacement	Dam Breach	Riparian Enhancement	Portion Proposed Natural SED	High Protection Value	
South Key Peninsula + Islands Anderson Island	AND IS 1	X					X		DNR; WSWC 2011
	AND IS 2	X		X	X		X		KGI Study; WSWC 2011
	AND IS 3		X			X	X		KGI Study
	AND IS 4	X					X		KGI Study; EXISTING SED
	AND IS 5	X					X		EXISTING SED; WSWC 2011
Carr Inlet - Henderson Bay	CI-HB 1	X					X		KGI Study
	CI-HB 10	X				X	X	X	KGI Study; SPSSRG
	CI-HB 11	X				X	X	X	KGI Study; SPSSRG
	CI-HB 12	X				X	X	X	KGI Study; SPSSRG
	CI-HB 13	X	X			X	X	X	KGI Study; SPSSRG; WSWC 2011
	CI-HB 2	X					X	X	KGI Study; SPSSRG
	CI-HB 3	X	X			X	X		KGI Study; SPSSRG
	CI-HB 4	X					X		KGI Study; SPSSRG
	CI-HB 5	X	X	X		X	X	X	KGI Study; SPSSRG; WSWC 2011
	CI-HB 6	X	X			X	X	X	KGI Study; SPSSRG
	CI-HB 7	X	X	X		X	X	X	KGI Study; SPSSRG
	CI-HB 8	X					X	X	KGI Study; SPSSRG
	CI-HB 9	X			X		X	X	KGI Study; SPSSRG

Management Units	Reach Name	Restoration Opportunities					Protection		Source
		Structure/Bulkhead Removal	Stream/Marsh Restoration	Culvert Maintenance/ Replacement	Dam Breach	Riparian Enhancement	Portion Proposed Natural SED	High Protection Value	
Case Inlet	CI-1						X		
	CI-10	X	X				X		KGI Study
	CI-11						X		KGI Study
	CI-2	X					X		KGI Study
	CI-3						X		
	CI-4				X		X		KGI Study
	CI-5	X		X	X		X		KGI Study
	CI-6	X					X		KGI Study
	CI-7						X		KGI Study
	CI-8	X				X	X		KGI Study
	CI-9						X		
Colvos Pass-Tacoma Narrows	CP-TN 1	X					X		KGI Study
	CP-TN 2	X	X				X		KGI Study
	CP-TN 3	X	X			X	X		KGI Study
	CP-TN 4	X				X	X		KGI Study
Dash Point	DP	X	X	X		X			KGI Study
Hale Passage - Wollochet Bay	HP-WB 1	X					X		KGI Study
	HP-WB 2		X			X	X		KGI Study
	HP-WB 3	X					X		KGI Study; Regional Salmon Recovery
S.Key Peninsula + Islands Ketron Island	KTRN IS					X			KGI Study
McNeil Island	MCN IS 1	X					X		KGI Study
	MCN IS 2	X		X			X		KGI Study; EXISTING SED; WSWC 2011
	MCN IS 3	X		X			X		KGI Study; EXISTING SED; WSWC 2011
	MCN IS 4	X		X			X		KGI Study; EXISTING SED; WSWC 2011

Management Units	Reach Name	Restoration Opportunities					Protection		Source
		Structure/Bulkhead Removal	Stream/Marsh Restoration	Culvert Maintenance/ Replacement	Dam Breach	Riparian Enhancement	Portion Proposed Natural SED	High Protection Value	
South Key Peninsula	SKEY 1	X					X		<i>KGI Study</i>
	SKEY 2	X					X		<i>WSWC 2011</i>
	SKEY 3	X					X		<i>KGI Study</i>
Nisqually Delta	NISQ01		X					X	<i>Regional Salmon Recovery Plan</i>

Table 5-5. Nearshore Restoration Opportunities (WRIA 15)

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
All Marine reaches – WRIA 15	<ol style="list-style-type: none"> 1. Hardened shoreline interrupts natural net shore drift. 2. Solid decking on docks and over-water structures creates shade and impacts aquatic vegetation and in-water habitats. 3. Failing septic systems negatively affect water quality. 4. Stormwater runoff contributes to pollutant loading, especially heavy metals, sediment and oils/grease. 5. Trees and native vegetation are lacking within the shoreline jurisdiction in urbanized and residential areas. 	All reaches	<p><u>Programmatic opportunities:</u></p> <ul style="list-style-type: none"> • Replace hard armoring with alternatives methods for bank stabilization – throughout management area • Replace non-functioning bulkheads • Replace solid decks with grating where possible to enhance light penetration • Water quality improvement through septic upgrades • Stormwater management of urban runoff • Restore and revegetate residential shorelines
Colvos Passage – Tacoma Narrows	Modifications in this management unit include fill and structures within the beach/intertidal area; concrete bulkheads and other hard armoring; removal of riparian vegetation; numerous overwater structures; filling and/or restriction of tidal flows in shoreline wetlands	CP TN 1 – Relict structure removal, Bulkhead removal, Artificial fill removal	<ul style="list-style-type: none"> • North of Point Richmond, area of concrete bulkheads, former industrial/commercial buildings, jetties and fill in the upper beach area – removal of concrete walls, vaults, stone jetties, docks/piers and fill; • Regrade to natural contours and replant native vegetation in the backshore/riparian area
		CP TN 1 – Riparian enhancement; replace hard armoring with bioengineering	<ul style="list-style-type: none"> • Point Richmond, encourage owners of residences on the beach to remove hard armoring and replace with bioengineering; • Plant native vegetation adjacent to the shoreline

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
Colvos Passage – Tacoma Narrows (continued)		CP TN 2 – Bulkhead removal, Marsh restoration	<ul style="list-style-type: none"> • South of Pt. Richmond, scattered residential structures on beach or just upland from beach could be encouraged to remove unnecessary armoring and/or replace with soft engineering • Investigate potential to remove some structures that do not appear to be actively used • Two of the larger structures occur where very small drainages or seeps enter the water – both areas appear to have remnant salt marsh that could be enhanced or restored (AU 1.08 and 1.09 in KGI)
		CP TN 3 – Riparian enhancement, Relict structure removal	<ul style="list-style-type: none"> • Although heavily developed, some opportunities for enhancement of riparian vegetation on residential/commercial properties and removal of relict structures
		CP TN 3 – Replace solid decking with grated to allow light penetration	<ul style="list-style-type: none"> • Look for willing owners to replace existing solid decking
		CP TN 3 – Marsh/estuary restoration at Crescent Creek mouth	<ul style="list-style-type: none"> • Widen road crossing; look for opportunities to purchase and remove buildings that are in the estuary • Coordinate restoration efforts with City of Gig Harbor (ESA Adolfson, 2008).

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
Colvos Passage – Tacoma Narrows (continued)		CP TN 4 – Bulkhead removal, Riparian enhancement	<ul style="list-style-type: none"> • Although most of this reach is relatively undeveloped, with active feeder bluffs, several small concentrations of houses/structures on the beach at the northern end of the reach present opportunities for removal of bulkheads and/or replacement with soft armoring, • Potentially removal of derelict structures, and riparian enhancement on residential lawns. • Coordinate with City of Gig Harbor to protect feeder bluffs along Tacoma Narrows (ESA Adolfson, 2008).
Hale Passage – Wollochet Bay	<p>There are areas of high quality habitat with relatively intact processes and functions in this management unit, but alterations are also significant. Modifications include large areas of shoreline armoring; overwater structures; a lack of marine riparian vegetation; restrictions to tidal flow and fill in salt marshes/estuaries; stormwater runoff from impervious surfaces; and structures and debris within the beach/intertidal area. Water quality impairments include fecal coliform and dissolved oxygen, with areas within Wollochet Bay designated as a prohibited shellfish growing area.</p>	HP WB 1 – Relict structure removal	<ul style="list-style-type: none"> • Old pilings at the mouth of Wollochet Bay (east end); • Small pocket estuary on east side of WB; salt marsh/pocket estuary enhancement at the head of WB; • Remove any barriers at road crossing (Artondale Creek), look for opportunities to remove structures from estuary (Wollochet Creek)
		HP WB 1 – Riparian enhancement	<ul style="list-style-type: none"> • Numerous opportunities to enhance native riparian vegetation where there are existing lawns adjacent to shoreline

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
Hale Passage – Wollochet Bay (continued)		HP WB 2 – Marsh restoration	<ul style="list-style-type: none"> • East of Shaw’s Cove, small pocket estuary with some fill encroaching into the estuary and low bulkheads that could be removed to restore more marsh area
		HP WB 2 – Riparian enhancement	<ul style="list-style-type: none"> • Numerous opportunities to enhance riparian vegetation along the heavily developed residential shoreline areas
		HP WB 2 – Bulkhead removal/alternative bank stabilization	<ul style="list-style-type: none"> • Numerous areas appear to be suitable for either removal of existing armoring or replacement with bioengineered/soft bank stabilization alternatives (see marsh restoration above)
		HP WB 3 – Dilapidated dock/pier removal	<ul style="list-style-type: none"> • Abandoned ferry dock and pilings
		HP WB 3 – Bulkhead removal	<ul style="list-style-type: none"> • Multiple sites that contain bulkheads that could be removed and/or replaced with bioengineered alternatives

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
Carr Inlet – Henderson Bay	<p>This management unit contains numerous large and small embayments, extensive mudflats, eelgrass, estuaries and salt marshes and productive shellfish areas. Alterations to processes are significant in some areas and relatively intact in other. Major modifications include areas that lack marine riparian vegetation; concentrated areas of heavily armored shoreline and overwater structures; and fill and restrictions of tidal flows in estuaries and salt marshes.</p> <p>Water quality impairments are exacerbated in this management unit due to the naturally low flushing rates of the long, shallow embayments. Water quality issues include fecal coliform, dissolved oxygen, nitrite, and PCBs and areas of concern include Mayo Cove, Horsehead Bay, Geldern Cove, and Burley Lagoon. Sources of water quality impairment failing septic systems, and stormwater runoff from roads and residential lawns.</p>	CI HB 1 - Bulkhead Removal	<ul style="list-style-type: none"> Multiple sites that contain bulkheads that could be removed and/or replaced with bioengineered alternatives
		CI HB 2 – Relict Structure Removal	<ul style="list-style-type: none"> Derelict structure on Shaw’s Cove spit
		CI HB 3 – Dilapidated dock/pier removal	<ul style="list-style-type: none"> Remnants of wooden dock in Horsehead Bay
		CI HB 3 – Marsh restoration	<ul style="list-style-type: none"> Moorelands Estuary Restoration – removal of tide gate and restoration of tidal flows

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
Carr Inlet – Henderson Bay (continued)		CI HB 4 – Bulkhead removal	<ul style="list-style-type: none"> Multiple locations where bulkheads appear to have little value and could be removed and/or replaced with alternative bank stabilization and enhance riparian vegetation adjacent to the shoreline
		CI HB 5 – Bulkhead removal; dilapidated dock/pier removal; Marsh restoration; Riparian enhancement	<ul style="list-style-type: none"> Marsh restoration opportunities at Lay Creek (fill and armoring in former estuary associated with scattered structures) Multiple locations where bulkheads appear to have little value and could be removed and/or replaced with alternative bank stabilization and enhance riparian vegetation adjacent to the shoreline Ray Nash Creek – resize culverts and control invasive vegetation
		CI HB 6 – Bulkhead removal; Marsh restoration	<ul style="list-style-type: none"> Lagoon at south end of reach has accumulated a large amount of woody debris which may be encroaching on marsh habitat; Multiple locations where bulkheads appear to have little value and could be removed and/or replaced with alternative bank stabilization and enhance riparian vegetation adjacent to the shoreline Coordinate restoration efforts with City of Gig Harbor (ESA Adolfson, 2008).

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
Carr Inlet – Henderson Bay (continued)		CI HB 7 – Culvert maintenance, Relict structure removal, Riparian enhancement, Stream mouth restoration;	<ul style="list-style-type: none"> • Mouth of Purdy Creek riprap armoring, debris, dilapidated structures and fill – removal of debris, riparian enhancement, and restoration of shoreline here would increase estuarine and mudflat habitat • Culvert beneath Hwy 16 may be barrier to fish passage; culvert improvements may improve access, although habitat quality upstream may be questionable • Restoration of riparian vegetation along the lower section of Purdy Creek would enhance temperatures and habitat quality for juvenile salmonids • Coordinate restoration efforts with City of Gig Harbor (ESA Adolfson, 2008).
		CI HB 8 – Relict structure removal	<ul style="list-style-type: none"> • Derelict structure (wood raft?) on beach north of Minter Creek mouth
		CI HB 9 – Relict structure removal	<ul style="list-style-type: none"> • Pilings on west side of Minter Creek estuary
		CI HB 9 – Marsh restoration	<ul style="list-style-type: none"> • Some potential for removal of fill, setback of armoring/removal of armoring, and culvert improvements to expand area of estuarine and marsh habitat at mouth of Minter Creek
		CI HB 10 - Bulkhead Removal	<ul style="list-style-type: none"> • Several failing bulkheads and/or bulkheads that do not provide significant protection could be removed to restore more natural shoreline

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
Carr Inlet – Henderson Bay (continued)		CI HB 11 - Bulkhead Removal, Riparian Enhancement	<ul style="list-style-type: none"> Glen Cove – along the west side of the cove debris bulkheads could be removed with shoreline restoration and riparian enhancement
		CI HB 12 - Bulkhead Removal, Riparian Enhancement	<ul style="list-style-type: none"> Multiple locations where bulkheads appear to have little value and could be removed and/or replaced with alternative bank stabilization and enhance riparian vegetation adjacent to the shoreline
		CI HB 12 – Silver Bow Farms Estuary Restoration (SPSSEG)	<ul style="list-style-type: none"> Complete scoping and landowner negotiations Complete final design and permitting Construction project
		CI HB 13 - Bulkhead Removal, Dilapidated Dock/pier Removal, Relict Structure Removal	<ul style="list-style-type: none"> Mayo Cove – opportunities for removing debris, dilapidated docks/floats, dilapidated structures/piles, and failing bulkheads in intertidal/marsh areas Von Geldern Cove – Remove bulkheads Entire reach – numerous opportunities to evaluate removal or replacement of existing vertical hard armoring with bioengineering alternatives

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
South Key Peninsula and Islands	<p>This management unit contains large areas of relatively intact feeder bluffs, marine riparian vegetation, and active LWD recruitment. There are few major streams, but several large bays (Filucy, Amsterdam, and Oro Bays, and Still Harbor) and numerous smaller bays and pocket estuaries. Shellfish concentrations, eelgrass, and potential forage fish habitat occur throughout the management unit. Although this management unit has relatively high quality habitat and relatively intact processes, important modifications include concentrated areas of shoreline armoring, fill in intertidal areas, and overwater structures; localized water quality impairments from failing septic systems and stormwater runoff; and loss of riparian vegetation.</p>	<p>CI-1 to CI - 6 (SS); Taylor Bay AR</p>	<ul style="list-style-type: none"> Restore pocket estuaries on southern Key Peninsula
		<p>Reaches on western side of Key Peninsula</p>	<ul style="list-style-type: none"> Protect functioning drift cells on western side of Key Peninsula and associated depositional areas
		<p>AND 2</p>	<ul style="list-style-type: none"> East Oro Bay Dam Removal/Estuary Restoration (SPSSEG: KGI) Finalize scoping and landowner negotiations, complete final designs and permitting; and construct project Dilapidated dock removal, culvert maintenance, relict structure removal Protect pocket estuary
		<p>AND 4</p>	<ul style="list-style-type: none"> Relict Structure Removal
		<p>AND 1, 3 and 5</p>	<ul style="list-style-type: none"> Protect and maintain or restore small pocket estuaries and feeder bluffs

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
South Key Peninsula and Islands (continued)		AND 1 and 5	<ul style="list-style-type: none"> Remove bulkheads
		All reaches, Anderson Island	<ul style="list-style-type: none"> Restore pocket estuaries on Anderson Island (Thompson Cove PF/AR; East Oro Bay AR; Johnson Landing AR; Amsterdam Bay) Acquire and protect ecologically intact shoreline at Jacobs Point
		McNeil Island	<ul style="list-style-type: none"> Wastewater reclamation and reuse retrofits to improve water quality
		Restore pocket estuaries on the north shore of McNeil Island	<ul style="list-style-type: none"> Culvert maintenance/restore tidal connection and remove passage barriers currently resulting from roadway
		MCN IS 1	<ul style="list-style-type: none"> Relict structure removal; bulkhead removal
		McNeil Island, Reaches 2, 3 and 4	<ul style="list-style-type: none"> Culvert maintenance Remove bulkheads and tidegates
		Ketron Island	<ul style="list-style-type: none"> Protect small pocket estuary
		SKEY 1 – Bulkhead removal	<ul style="list-style-type: none"> Entire reach – numerous opportunities to evaluate removal or replacement of existing vertical hard armoring with bioengineering alternatives
		SKEY 1 – Dilapidated dock/pier removal	<ul style="list-style-type: none"> Southern stretch of reach wooden dock could be removed

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
South Key Peninsula and Islands (continued)		SKEY 2	<ul style="list-style-type: none"> Filucy Bay – failing septic; sources of nutrients Filucy Bay – remove bulkheads, docks and piers; protect pocket estuary
		SKEY 3 – Bulkhead removal	<ul style="list-style-type: none"> Several opportunities to evaluate removal or replacement of existing vertical hard armoring with bioengineering alternatives
Case Inlet	<p>This management unit contains large areas of relatively intact feeder bluffs, marine riparian vegetation, and active LWD recruitment. There are moderately sized streams and bays (Rocky Creek, Vaughn Creek, Purdy Creek, Whiteman Cove, Dutcher Cove, and Taylor Bay) and numerous smaller bays and pocket estuaries. Although this management unit has relatively high quality habitat and relatively intact processes, important modifications include concentrated areas of shoreline armoring, fill in intertidal areas, and overwater structures.</p> <p>Localized water quality impairments from failing septic systems and stormwater runoff; and loss of riparian vegetation. Water quality impairments are exacerbated in this management unit due to the naturally low flushing rates of the long, shallow embayments. Water quality issues include fecal coliform, dissolved oxygen, ammonium and nitrite nitrogen.</p>	CI 2 - Relict Structure Removal; Bulkhead removal	<ul style="list-style-type: none"> Opportunities to remove relict structures and/or remove/replace bulkheads along Taylor Bay

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
Case Inlet (continued)		CI 4 - Dam/dike Breach	<ul style="list-style-type: none"> Restore tidal action and salt marsh to Whiteman Cove by removing/modifying tide gates and/or breaching the spit in one or more places
		CI 5 - Bulkhead removal, Culvert Maintenance, Dam/dike Removal	<ul style="list-style-type: none"> Former lagoon behind spit at Camp Gallagher could be restored to salt marsh habitat by restoring tidal connections to lagoon – currently restricted by construction of road and filling of portion of spit and former marsh – breaching roadway and installing larger culverts
		CI 5 – Bulkhead removal	<ul style="list-style-type: none"> Entire reach – numerous opportunities to evaluate removal or replacement of existing vertical hard armoring with bioengineering alternatives
		CI 6 – Marsh/pocket estuary restoration	<ul style="list-style-type: none"> Small estuary on peninsula just north of Herron Island – removal of fill and reconstruction of bridge would open more habitat to tidal influence and additional marsh habitat could be restored
		CI 6 – Bulkhead removal	<ul style="list-style-type: none"> Entire reach – some opportunities to evaluate removal or replacement of existing vertical hard armoring with bioengineering alternatives to restore intertidal and beach habitat
		CI 6 - Relict Structure Removal	<ul style="list-style-type: none"> Dutcher Cove opportunities for derelict structure/debris removal
		CI 7 - Bulkhead removal	<ul style="list-style-type: none"> Just south of Vaughn Bay – some opportunities for removing bulkheads and/or replacing with soft alternatives – esp. where bulkheads extend into deeper water

Table 5-5 continued.

Water Body /Management Unit	Problems and Issues	Reach or Location	Restoration Opportunities
Case Inlet (continued)		CI 8 - Dam/dike Breach	<ul style="list-style-type: none"> North shore of Vaughn Bay, wooden bulkhead/weir blocks small stream mouth; this could be removed to restore small estuary; protect adjacent structures with bioengineering
		CI 8 - Bulkhead Removal	<ul style="list-style-type: none"> A number of concrete bulkheads do not appear to protect any structures but lawns or fields – these could be removed, shoreline gradients and riparian vegetation restored
		CI 10 - Dilapidated Dock/Pier Removal	<ul style="list-style-type: none"> Southern shore of Rocky Bay, opportunities for removing debris, dilapidated docks from intertidal
		CI 10 - Bulkhead Removal	<ul style="list-style-type: none"> Multiple sites with vertical bulkheads, extensive riprap do not appear necessary for protection of structures; evaluate removal and/or replacement with soft alternatives

Data Sources: Key Peninsula Gig Harbor and Islands Nearshore Assessment (Pentec, 2003), Key Peninsula Basin Plan (Pierce County 2006); East WRIA 15 Three-Year Work Plan (West Sound Watersheds Council, 2011)

Table 5-6. Nearshore Restoration Opportunities (WRIA 15) Identified by the South Puget Sound Salmon Recovery Group (SPSSRG) - Carr Inlet – Henderson Bay

Reach Name	Management Recommendation ⁸
CI-HB 2	High protection value. Prevent future armoring.
	Potentially very high benefit of restoration for forage fish and salmonids. Pursue opportunities for soft armoring, riparian restoration and community docks.
	Some eelgrass.
	High protection areas.
CI-HB 3	Good eelgrass and forage fish habitat. Shoreline has opportunities for both protection and restoration. Potential to address over-water structures, community docks, riparian conditions, and stormwater control.
	Potentially very high benefit of restoration for forage fish and salmonids. Pursue opportunities for soft armoring, riparian restoration and community docks.
CI-HB 4	Kopachuck State Park. Cutts Island. Eelgrass present and high protection benefit.
	Eelgrass present. Restoration: bulkhead removal, riparian planting, retro-fit grounding dock.
	Kopachuck State Park. Protection benefits include shellfish beds, diverse intertidal habitat, feeder bluffs, and riparian vegetation. Restoration opportunities include bulkhead removal and soft armoring.
CI-HB 5	Restoration: bulkhead removal, riparian planting, retrofit grounding dock.
	Address sediment transport issues associated with dock and shoreline armoring.
	Low gradient protected area with mud flats. Drains at low tides. Restoration: soft bank armoring, riparian planting, retrofit grounded docks, and open road.
	Raft Island: feeder bluff. Eelgrass. Low energy shallow protected waters for salmon feeding. Restoration: bulkhead removals, riparian planting. Protect small area on east point.
	Restoration: bulkhead removal, riparian planting, retro-fit grounding dock, piling removal.
	Some trees located at the south end. Restoration: riparian planting.
	Low gradient protected area with mud flats. Drains at low tides. Restoration: soft bank armoring, riparian planting, retrofit grounded docks.

Table 5-6 continued.

Reach Name	Management Recommendation ⁸
CI-HB 5	Eelgrass present. Restoration: bulkhead removal, riparian planting, retro-fit grounding dock. Site visit to evaluate lagoon connectivity, stressors, and restoration opportunities.
	Protect riparian zone.
	High protection benefits riparian vegetation and shoreline. Opportunities may include improving road that cut-off marsh.
CI-HB 6	Restoration potential for creek mouth
	Freshwater input. Protect riparian zone. Restoration: bulkhead removal.
	Eelgrass beds offshore. Education: value of shoreline vegetation for slope stability.
	Address shoreline modification caused by residential development. Education: value of shoreline vegetation for slope stability.
	Eelgrass beds offshore. Protect: high value riparian zone, old landslide feeding eelgrass beds
	Riparian enhancement
	Feeder bluff. High protection value as it feeds forage fish spawning beaches and eelgrass beds.
	Address shoreline development issues.
	Pocket estuary. High protection, especially riparian zone and feeder bluff that is providing sediment.
	Remove bulkheads and improve riparian conditions
	Extensive eelgrass offshore
	Address shoreline armoring of feeder bluff to this spit. Assess status of opening.
CI-HB 7	Protect riparian, marsh, and mudflat
	Restoration: debris and relic structure removal, riparian enhancement, culvert maintenance, marsh restoration.
CI-HB 8	Feeder bluff to eelgrass beds and spit. Protect feeder bluff, riparian zone

Table 5-6 continued.

Reach Name	Management Recommendation ⁸
CI-HB 9	High protection benefit Restoration: culvert and road
	Restoration: relic piling removal.
CI-HB 10	Feeder bluffs to eelgrass and spit. High protection value. Remove derelict pilings. Remove non-functioning bulkhead
	Remove fill from back shore. Forage fish spawning beach and eelgrass beds. Protection: feeder bluff. Restoration: remove bulkheads in backshore, riparian enhancement.
	Eelgrass beds. Protection: feeder bluff. Restoration: remove bulkheads in backshore; riparian enhancement.
	Feeder bluff. High protection value as it feeds forage fish spawning beaches and eelgrass beds. Good riparian.
CI-HB 11	Forage fish spawning. Pocket estuary. High value protection. High restoration value.
	Restore riparian removed around house.
CI-HB 12	High protection value. Restoration: restore riparian, remove bridge to spit.
	Restoration: remove swimming pool in backshore.
	Feeder bluffs to eelgrass beds and forage fish spawning beach. High protection value. Restoration: remove bulkheads and riparian enhancement.
	Restoration: remove derelict pilings
	Eelgrass beds. Forage fish. Feeder bluff supplying sediment to both habitats. High protection value. Good riparian condition.
	Moderate protection value for high quality open shoreline in parts.
CI-HB 13	Restoration: some bulkhead in backshore.
	Restoration: would need to be extensive and restore sediment processes, extensive revegetation would be valuable.
	Forage fish spawning. Eelgrass. High protection value. Good habitat. Restoration: bulkhead removal, derelict structure removal, riparian enhancement. Restore lost salt marsh in Penrose State Park. Possible diked farmland. Derelict groin removal.

⁸ Management recommendations provided by T. Kantz; Access database from SPSSRG.

Table 5-7. Freshwater Restoration Opportunities in Kitsap Peninsula and Islands Watershed (WRIA 15)

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Crescent Lake	Invasive species; high phosphorous levels; dock and bulkhead construction.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Enhance native riparian vegetation to restore buffers around the lake. Evaluate non-native species control in lake. Support actions of Crescent Valley Alliance. Implement Crescent Valley Biodiversity Management Area stewardship plan. 	Moderate to High	Shading and organic input Fish and wildlife habitat Water quality	Long-term
Minter Creek	Fish passage barriers (culverts, diversion/intake structures at the hatchery); altered instream and riparian habitat conditions in the lower reaches; removal of riparian vegetation; bank armoring; channel alterations; water quality impairments.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Remove invasive vegetation and restore riparian habitat. Coordinate with the hatchery to improve water quality and enhance instream habitat (Key Peninsula-Islands Basin Plan). <u>Site-specific opportunities:</u> <ul style="list-style-type: none"> Complete design, permitting, and construction of Little Minter Creek culvert/passage barrier (SPSSEG) to provide access to additional two miles of habitat. 	Moderate to High	Shading and organic input Fish and wildlife habitat Water quality	Long-term for programmatic opportunities Short-term for site-specific opportunities
Carney Lake	Some residential bulkheads and docks.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore native riparian vegetation where lacking. Remove derelict overwater structures where present. Replace failing bulkheads with soft alternatives for shoreline restoration. 	Moderate to High	Shading and organic input Fish and wildlife habitat	Long-term
Stansberry Lake	Residential bulkheads; removal of shoreline vegetation.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Restore shoreline areas with native forested vegetation. 	Moderate to High	Shading and organic input Fish and wildlife habitat	Long-term
Rocky Creek	Barriers to fish passage (144th Street pipe culvert); and water quality impairments for dissolved oxygen and temperature.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> Remove historic pilings from nearshore areas. Remove invasive vegetation and restore riparian habitat. Coordinate with the hatchery to improve water quality and enhance instream habitat. <u>Site-specific opportunities:</u> <ul style="list-style-type: none"> Construct Rocky Creek Fish Passage Project (SPSSEG) to provide access to additional five miles of habitat. 	Moderate to High	Shading and organic input Fish and wildlife habitat Water quality	Long-term for programmatic opportunities Short-term for site-specific opportunities

Table 5-7 continued

Basin and Water Body	Problems and Issues	Reach or Location	Restoration Opportunities	Relative Priority of Actions	Ecosystem Functions Addressed	Timing
Lake Minterwood	Residential development, docks and bulkheads.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> • Work with private property owners to revegetate shoreline areas with native plant species. • Remove derelict overwater structures where present. • Replace failing bulkheads with soft alternatives for shoreline restoration. 	Moderate	Shading and organic input Fish and wildlife habitat	Long-term
Jackson Lake	Some residential bulkheads and docks, especially at south end of lake.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> • Revegetate shoreline areas where native vegetation is lacking. • Remove derelict overwater structures where present. • Replace failing bulkheads with soft alternatives for shoreline restoration. 	Moderate to High	Shading and organic input Fish and wildlife habitat	Long-term
Bay Lake	Few developed properties; much of shoreline is forested.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> • Preserve existing forested shoreline. 	Moderate	Shading and organic input Fish and wildlife habitat	Long-term
Butterworth Reservoir	Limited docks, roads along shoreline; reservoir is the drinking water supply for McNeil Island.	All reaches	Restoration is likely not feasible for this shoreline due to its use in a water supply system.	Not applicable	Not applicable	Not applicable
Florence Lake	Invasive milfoil; residential development, bulkheads, docks.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> • Restore degraded shoreline areas with native vegetation. • Remove derelict overwater structures where these exist. • Replace failing bulkheads with softer alternatives. • Continue milfoil control efforts. 	Moderate	Shading and organic input Fish and wildlife habitat Water quality	Long-term
Josephine Lake	High phosphorous levels; residential bulkheads and docks.	All reaches	<u>Programmatic opportunities:</u> <ul style="list-style-type: none"> • Restore degraded shoreline areas with native vegetation. • Remove derelict overwater structures where these exist. • Replace failing bulkheads with softer alternatives. 	Moderate	Shading and organic input Fish and wildlife habitat	Long-term

Sources: Crescent Valley Alliance, KGI Watershed Council, Pierce County Key Peninsula-Islands Basin Plan (Pierce County, 2006)

The problem evaluation was completed to prioritize limited resources for the development of solutions for a subset of highly ranked problems. Criteria used to evaluate flood and channel migration problems included:

1. Existing land use of affected area (Consequences) – This criterion gave different weights to different types of land uses affected by flooding, including critical facilities, public infrastructure, commercial/industrial uses, residential, resource lands, and recreational lands.
2. Severity of potential flood or channel migration impact – This criterion was intended to evaluate the type and magnitude of the impacts irrespective of the scale at which the impact occurred. This included public safety problems; severe, moderate or minor infrastructure or property damage, and inconvenience flooding or channel migration.
3. Spatial area of impact (consequences and severity) – This criterion describes the scale of the problem. Is the problem over a large area or in a manner that will affect a large number of people, or is it largely localized? Categories were regional (large scale impacts), severe (city center, large neighborhoods), moderate (numerous structures or roads impacted) and localized (affects a few homes or businesses).
4. Frequency of flood or channel migration occurrence – This criterion is used to describe how often the flood or channel migration event occur (i.e., a channel migration event is any significant landward bank erosion¹⁸). Categories were: 1) three or more occurrences in the past 20 years; 2) two occurrences; 3) one occurrence; or 4) has not occurred (but would likely occur in a 1 percent annual chance flood).

Additional floodplain management considerations were taken into account as part of problem identification and evaluation process, but lacked sufficient data to support an empirical, criteria-driven evaluation:

- Facility maintenance and repair needs,
- Inconsistent floodplain development regulations across jurisdictions,
- Fish habitat problem areas, and
- Public access issues.

ES.5.2 Programmatic Recommendations

The Plan includes programmatic recommendations and non-structural actions to reduce the associated risks of flooding and channel migration problems along the major rivers and streams in Pierce County (Chapter 4). The recommendations include programs such as mapping of risks, technical assistance, public education and outreach, flood warning¹⁹ and emergency response,

¹⁸ **Erosion** – Detachment of soil or rock fragments by water, wind, ice and gravity.

¹⁹ **Flood Warning** - A warning issued by the NWS to warn of river flooding which is imminent or occurring. A flood warning is issued when a river first exceeds its flood stage, and it may be reissued if a new river forecast for a forecast point or reach is significantly higher than a previous forecast.

monitoring, facility maintenance, sediment and wood management, as well as land use and regulations to reduce future risks (see Table ES.2). Some programmatic recommendations bear directly on capital projects such as river management strategies, levels of protection, the levee setback program, and roads and bridges. Recommended programs address the goals, objectives, applicable policies, and problems found in the Flood Plan.

Each of the programmatic recommendations provides a description of the issue being addressed, as well as background and other supporting information. Recommendations are numbered and apply either “flood plan-wide” (FPW), or to a specific river system (e.g., Puyallup River (PR)). The specific recommendation language was agreed upon by the Flood Plan Advisory Committee.

Table ES 2 – Programmatic Recommendations

Information/Mapping/Technical Assistance	
FPW #1	<p><u>Floodplain Mapping</u></p> <p>These recommendations address the adoption and use of preliminary FEMA flood maps (DFIRMs) and other flood studies; subsequent periodic update of such studies; related communication with agencies and the public; and other issues related to flood hazard mapping. <i>(Pierce County, cities/towns, other agencies, public)</i></p>
FPW #2	<p><u>Channel Migration Zone Mapping and Regulation</u></p> <p>These recommendations address the completion and adoption of CMZ studies within Pierce County; regulation of severe channel migration zones as floodways; evaluating levees/revetments for resistance to channel migration, revisions to CMZ mapping to reflect changes in risks, and notification of hazards. <i>(Pierce County, cities/towns, public)</i></p>
FPW #3	<p><u>Technical Assistance on Floodplain Information</u></p> <p>These recommendations address internal Pierce County training; external technical assistance to public and private entities; and coordination on repair and replacement of infrastructure in flood hazard areas. Also includes coordination to ensure compatible uses of floodplains. <i>(Pierce County, cities/towns, public)</i></p>
FPW #4	<p><u>Flood Insurance and the Community Rating System (CRS)</u></p> <p>These recommendations address participation in the National Flood Insurance Program and the Community Rating System, encouraging communities to achieve a CRS rating of Class 5 or better; and promotion of flood insurance. <i>(Pierce County, cities/towns)</i></p>
Land Use/Regulatory/Acquisition/Structure Elevation	
FPW #5	<p><u>Consistent Floodplain Development Regulations</u></p> <p>These recommendations address consistency of floodplain and flood hazard area regulations between Pierce County and cities/towns; regulation based on best available data; zero rise and compensatory storage²⁰ regulations; establishment of a regulatory working group to support consistency and assess residual flood risks and appropriate regulations behind certified levees. <i>(Pierce County, cities/towns)</i></p>

²⁰ **Compensatory Storage** – New excavated storage volume equivalent to the flood storage capacity eliminated by filling or grading within the floodplain. For any fill placed below the base flood elevation, an equal volume will be removed from the

Table ES 2 – Programmatic Recommendations

Table ES 2 – Programmatic Recommendations	
FPW #6	<p><u>Urban Growth Area Expansion</u></p> <p>This recommendation extends the current prohibition on expansion of Urban Growth Areas into the 100-year regulatory floodplain of the Flood Plan planning area. <i>(Pierce County, cities/towns)</i></p>
FPW #7	<p><u>Agricultural Land Uses and Activities</u></p> <p>These recommendations address review of and amendments to Pierce County code to enable agricultural practices in floodplains, including removal of sediment deposited by floods, construction of flow-through non-residential agricultural structures, promoting the leasing of publicly held floodplain lands suitable for agriculture, and allowing composting when accessory to on-site agriculture. <i>(Pierce County, public)</i></p>
FPW #8	<p><u>Floodplain Acquisition and Home Buyouts</u></p> <p>These recommendations address identification and evaluation of floodplain properties for home buyouts or property acquisition; outreach with floodplain property owners; pursuit of federal and state grant funding, coordination with other agencies, and local funding for proactive floodplain acquisition. <i>(Pierce County, cities/towns, public)</i></p>
FPW #9	<p><u>Home/Structure Elevation and Floodproofing</u></p> <p>These recommendations address technical assistance provided to floodplain property owners; identification of areas needing targeted outreach; and pursuit of grant funding to support an elevation program. <i>(Pierce County, public)</i></p>
River Channel Management	
FPW #10	<p><u>River Channel Monitoring</u></p> <p>These recommendations address monitoring of river channel²¹ conditions including river stage and flow, cross-sections, conveyance capacity, sedimentation trends, topography (LiDAR), aerial photos during floods, and project-specific monitoring to evaluate project effectiveness. <i>(Pierce County, other agencies)</i></p>
FPW #11	<p><u>Management of Large Woody Material</u></p> <p>These recommendations address the repositioning, relocation and removal of large woody material²² in Pierce County rivers posing imminent threat, LWM removal when threatening bridge piers and public infrastructure; working with resource agencies and tribes to identify rivers segments that function naturally; and obtaining approvals and coordinating with agencies in emergency and non-emergency situations. <i>(Pierce County, other agencies)</i></p>
PR#1/ WR#1/ CR#1	<p><u>Sediment Management and Gravel Removal</u></p> <p>These recommendations address the approach for sediment management and gravel removal, including use of technical data and studies; pursuing levee setback projects as the preferred means to manage</p>

floodplain at the same elevation as the placed fill. In addition, the excavated area must be hydraulically connected to the floodway through its entire depth (that is, it must drain out).

²¹ **Channel** – Natural or artificial waterway long enough to periodically or continuously contain moving water. It has a definite bed and banks that serve to confine water.

²² **Large woody material (LWM)** – Any piece of woody material, generally 12 inches or larger in diameter, that intrudes into a stream channel or nearby (e.g., logs, stumps or root wads) and that functions to form pools, regulate sediments, disperse stream energy, create channel complexity, stabilize channels, provide instream organic matter, and provide cover for fish.

Table ES 2 – Programmatic Recommendations

	downstream sediment transport; conditions under which gravel removal may occur; evaluating alternative approaches to gravel removal; monitoring locations of gravel removal; and convening a sediment management work group to develop a plan to guide sediment management and gravel removal. <i>(Pierce County, cities/towns, resource agencies, tribes)</i>
Facility Repair/Maintenance	
FPW #12	<u>Facility Repair & Maintenance – PL 84-99 Program</u> These recommendations addresses Pierce County’s participation in the Corps of Engineers’ PL84-99 program for emergency response activities and rehabilitation of flood risk reduction facilities; engaging in review of levee maintenance standards; maintaining program eligibility while pursuing bio-engineering designs; notifying, coordinating with and seeking input from resource agencies and tribes in implementation. <i>(Pierce County, Corps of Engineers, resource agencies, tribes)</i>
FPW #13	<u>Annual Repair and Maintenance Program</u> These recommendations address Pierce County’s repair and maintenance program for flood facilities, including routine repair and maintenance, evaluating options for long-term capital solutions, implementation of the Puyallup River vegetation management program, update of the County’s operations, repair and maintenance manual, and working with resource agencies and tribes to obtain programmatic approval of annual, repair and maintenance activities. <i>(Pierce County, resource agencies, tribes)</i>
Flood Hazard Education and Flood Preparedness, Flood Warning and Emergency Response	
FPW #14	<u>Flood Education and Outreach Program</u> These recommendations address consistency of education and outreach activities with the CRS program; outreach to floodplain property owners through the annual flood bulletin; promotion of all aspects of the County’s flood hazard management program; promotion of flood preparedness and purchase of flood insurance; internal and external coordination and collaboration. <i>(Pierce County, cities/towns, public)</i>
FPW #15	<u>Flood Warning and Evacuation System</u> These recommendations address regional coordination and communication before and during flood events with the National Weather Service, Pierce County’s River Watch program, Tacoma Public Utilities and Corps of Engineers (dam operators); and developing technical tools and mapping to improve river flooding forecasts to help guide evacuation decisions. <i>(Pierce County, cities/towns, other agencies, public)</i>
FPW #16	<u>Emergency Response and Flood Fighting</u> These recommendations address regional coordination of response and recovery services during and after flood events through the Emergency Operations Center; coordination with cities, towns, tribes, state and federal agencies; documenting all costs associated with response activities; sand bagging support; flood emergency exercises; and periodic updating of guidance and protocols. <i>(Pierce County, local jurisdictions, other agencies, public)</i>
Miscellaneous/Other	
FPW #17	<u>Incidental Take Authorization</u> These recommendations address Pierce County SWM seeking incidental take authorization for its activities that affect species listed as threatened or endangered under the federal Endangered Species Act (ESA). <i>(Pierce County, other agencies)</i>
FPW #18	<u>Adaptive Management</u> These recommendations address the use of adaptive management ²³ as a component of plan implementation, including evaluation and assessment of project and program performance, cost, and

²³ **Adaptive Management** - A systematic approach for continually improving management policies and practices by learning from the outcomes of operational programs.

Table ES 2 – Programmatic Recommendations

	effectiveness, and incorporation of learned information into future project actions. <i>(Pierce County, other agencies)</i>
FPW #19	<p><u>Climate Change</u></p> <p>These recommendations address development of an approach to incorporate information about climate change, including predicted changes in precipitation patterns, future peak flows, and sediment transport into future project designs and program implementation; and working with regional experts. <i>(Pierce County, cities/towns, other agencies)</i></p>
FPW #20	<p><u>Habitat and Riparian Areas Mitigation</u></p> <p>These recommendations address the restoration of fish habitat and riparian areas as part of advance mitigation for flood management projects, for circumstances where mitigation cannot be accomplished onsite; working with resource agencies and tribes to identify sites for mitigation; and allocating funds to a mitigation account to acquire property and construct advance mitigation projects. <i>(Pierce County, other agencies)</i></p>
FPW #21	<p><u>Public Access to Rivers</u></p> <p>These recommendations address public access to rivers, including passive use, shoreline access points, and multi-purpose trails; identifying opportunities for improved public access; recommending appropriate levels of future public access; and educating the public regarding restrictions on public access. <i>(Pierce County, cities/towns, public)</i></p>
FPW #22	<p><u>Minimizing Water Quality Impacts of Flooding</u></p> <p>These recommendations address the management of pollutant sources in floodplains subject to flooding, and potential water contamination, including storage of hazardous chemicals, wastes, pesticides, and fertilizers; leveraging of existing resources focused on stormwater and source control; and limitations, inspections, operations and maintenance for on-site sewage systems within 100-year floodplains. <i>(Pierce County and cities/towns)</i></p>
FPW #23	<p><u>Coordination with Other Jurisdictions, Tribes and Agencies</u></p> <p>These recommendations address coordination with other jurisdictions in flood plan implementation, including cities/towns, counties, tribes, state and federal agencies; and coordinating with local governments adjacent to and across the river from proposed capital projects. <i>(Pierce County, cities/towns, tribes, other counties)</i></p>
PR#2/ WR#2	<p><u>Inter-County River Improvement Agreement</u></p> <p>These recommendations address collaborating with King County to renew the Inter-County River Improvement Agreement to address necessary maintenance and capital project needs, responsibilities and funding for the Lower White and lower Puyallup Rivers (the original agreement is due to expire in 2013). <i>(Pierce and King counties)</i></p>
Capital Projects	
FPW #24	<p><u>River Reach Management Strategies</u></p> <p>This recommendation proposes four management strategies (levels of protection) for levees, two management strategies for revetments, and two non-structural strategies to address flood and channel migration risk reduction goals for different river reaches in the planning area; and encourages promotion of agriculture, recreation and open space as the most compatible land uses in the floodplain. <i>(Pierce County and cities/towns)</i></p>
FPW #25	<p><u>Levee and Revetment Setback Program</u></p> <p>These recommendations address updating the levee and revetment inventory map; updating the Setback</p>

Table ES 2 – Programmatic Recommendations

	Levee ²⁴ Feasibility Study; performing a comprehensive hydraulic study to determine cumulative benefits of flood protection of setback build-out scenario; pursuing funding for design and construction of setback projects; and evaluating additional sites for possible levee/revetment setbacks as new needs are identified. <i>(Pierce County, cities/towns, other agencies)</i>
FPW #26	<u>Additional Capital Project Analysis</u> This recommendation addresses the need to complete further analysis and develop solutions for Tier 2 problem areas for flooding and channel migration that could not be addressed in the Flood Plan due to resource and time constraints. <i>(Pierce County)</i>
FPW #27	<u>Transportation – Roads and Bridges</u> These recommendations address the need to examine transportation infrastructure design issues, including road designs accounting for compensatory storage, zero-rise, and elevation above BFE requirements; bridge designs considering scour ²⁵ , freeboard above BFE, assessment of future peak discharge flows and backwater effects, and passage of large woody material; conducting a cost benefit analysis for roads and bridges with high associated flood and erosion protection costs; and designing future roads and bridges (and replacements) to accommodate planned levee and revetment setback projects. <i>(Pierce County, cities/towns, WSDOT)</i>

The costs of implementing the programmatic recommendations vary due to the number of full-time equivalents to implement a program element, lump sum costs, and whether costs are annual, one-time, or for example, once every five years or during/following a flood event. Table ES.3 summarizes the programmatic costs (see also Appendix J).

Table ES 3 – Estimated Programmatic Costs

Type of Programmatic Action	Staff (FTE ^a /year)	Annual cost (based on FTE/year)	Annual Lump Sum (LS)	One-time LS or FTE	LS every 5 years	Total (annual; one-time)
Information/Mapping/ Technical Assistance	1.2	\$144,000	\$0	\$960,000	\$0	Annual: \$144,000 One-time: \$960,000
Land Use/Regulatory/ Acquisition/Elevation	0.7	\$84,000	\$0	\$27,000	\$0	Annual: \$84,000 One-time: \$27,000
River Channel Management	0.2 ^b	\$24,000	\$63,000	\$350,000 - \$470,000	\$265,000 - \$315,000	Annual: \$87,000 One-time: \$350,000 - \$470,000 Every five years: \$265,000 - \$315,000
River Management Facility Repair and Maintenance	2.2	\$264,000	\$1,455,000 - \$2,505,000	\$252,400	\$0	Annual: \$1,719,000 - \$2,769,000 One-time: \$252,400
Education, Flood Preparedness, Flood	0.95	\$114,000	\$35,000	\$105,000 - \$115,000	\$30,000	Annual: \$149,000

²⁴ **Setback Levee** – A levee that is set away from the river in a manner to allow the river channel to migrate in the areas between levees. Setback levees in Pierce County include the Soldiers Home and Ford Levees on the Puyallup River.

²⁵ **Scour** – Process by which floodwaters remove soil around objects that obstruct flow, such as a levee, the channel or a stream.

Table ES 3 – Estimated Programmatic Costs

Type of Programmatic Action	Staff (FTE ^a /year)	Annual cost (based on FTE/year)	Annual Lump Sum (LS)	One-time LS or FTE	LS every 5 years	Total (annual; one-time)
Warning and Emergency Response						
Coordination, Adaptive Management, and Multiple Benefits	0.6	\$72,000	\$100,000	\$325,000 - \$545,000	\$0	Annual: \$172,000 One-time: \$325,000 - \$545,000
Capital Project Planning	0.0	\$0	\$0	\$185,000 - \$275,000	\$40,000 - \$60,000	One-time: \$185,000 - \$285,000 Every five years: \$40,000 - \$60,000
Total	5.85	\$702,000	\$1,653,000 - \$2,703,000	\$2,184,400 - \$2,504,400	\$335,000 - \$405,000	Annual: \$2,355,000 - \$3,405,000 One-time: 2,204,400 - \$2,574,400 Every five years: \$335,000 - \$405,000

a FTE= Full Time Equivalent

b Other costs included as part of capital projects

ES.5.3 Capital Projects

The capital improvement projects²⁶ recommended within the Flood Plan address flooding and channel migration problems which have been identified for each river reach in Chapter 5. Each section of Chapter 5 provides a list of problems identified for the river reach and a description of recommended capital project solutions. The project descriptions provide a general overview of each project. Projects were selected after the completion of an initial feasibility analysis, permitting considerations, assessment of benefits, and project cost estimates. The cost estimates are for capital expenditures only and are preliminary, based on 2011 costs at planning design level (approximately 15 percent design level) and the information available at the time. For many of the projects multiple options were considered, however alternatives also had to be compared and filtered to be consistent with the policies and programmatic recommendations in the plan. Of the remaining alternatives only those which that provided the most benefit for the least project cost were recommended for inclusion in the Plan. Initial project analysis for each project was completed by multi-disciplinary teams of Pierce County staff. The estimates and descriptions provided are a starting point for further project development as the Flood Plan is implemented. Additional design and engineering will be required for each project as they are developed and will be included within the Capital

²⁶ **Capital Improvement Project.** - A capital improvement project is a constructed project facility such as a road improvement, flood or stormwater control facility that is generally of a durable nature. Capital improvement projects may be considered assets rather than as expenses for accounting purposes.

Improvement Element of the Pierce County Comprehensive Plan. The total estimated cost of the 32 capital projects is between \$350.8 and \$396.4 million (Table ES.4).

Preliminary prioritization of capital projects was carried out by scoring the projects based on eight criteria, as follows:

1. Existing land use of affected area (consequences)
2. Severity of potential flood or channel migration impact
3. Spatial area of impact (consequences and severity)
4. Frequency of flood or channel migration occurrence
5. Project effectiveness
6. Benefit-cost analysis²⁷ of project
7. Multiple project benefits
8. Partnerships and opportunity

Scoring was based on a 10-point scale for all criteria except existing land use of the affected area, which was a 20-point maximum, based on the two predominant land uses (see Appendix B). The maximum score was 90 points and the range of total scores was 33 to 66 (see Table ES 4).

Table ES 4 – Proposed Capital Improvement Projects

CIP#	Project Name/Location	Preferred Solution(s)	Score	Estimated Cost (2011 \$)
Lower Puyallup River				
LP1	Tacoma Wastewater Treatment Plant Flood Wall Left bank ²⁸ (RM 2.9-3.1)	Construct flood wall and storm drain backwater retrofit	65	\$5,200,000
LP2	Clear Creek Acquisition/Levee Left bank (RM 2.9 and backwater area)	Acquiring floodplain properties and construct a levee along Clear Creek	53	\$36,000,000 - \$55,000,000
LP3	Oxbow Lake Flooding/Sewer Lift Station Protection Right bank ²⁹ (RM 5.0 and backwater area)	Elevate sewer lift station	51	\$410,000
LP4	North Levee Road Setback Levee Right bank (RM 2.8-8.15)	Construct setback levee landward of N. Levee Road	61	\$104,000,000

²⁷ **Benefit-Cost Analysis (BCA)** – A quantitative procedure that assesses the desirability of a hazard mitigation measure by taking the long-term view of avoided future damages as compared to the cost of a project. The outcome of the analysis is a benefit-cost ratio, which demonstrates whether the net present value of benefits exceeds the net present value of cost

²⁸ **Left Bank** - The land area to the left, adjacent to the river channel, looking downstream.

²⁹ **Right Bank** - The land area to the right, adjacent to the river channel, looking downstream.

Table ES 4 – Proposed Capital Improvement Projects

CIP#	Project Name/Location	Preferred Solution(s)	Score	Estimated Cost (2011 \$)
LP5	Puyallup Wastewater Treatment Plant Flood Wall Left bank (RM 6.8-6.9)	Construct flood wall	60	\$2,500,000- \$3,500,000
LP6	Tiffany's Skate Inn/Riverwalk Flood Wall Left bank (RM 8.1-8.6)	Construct flood wall, and close road at underpass during flood events	44	\$4,500,000
LP7	Puyallup Executive Park Left bank (RM 9.1-9.25)	Construct flood wall and establish evacuation plan	48	\$160,000
LP8	Linden Golf Course Oxbow Setback Levee Left bank RM 9.6 – 10.5	Construct setback levee, side channel habitat. Phase II would remove 14 acre landfill	TBD	43,000,000
Middle Puyallup River				
MP1	Rainier Manor/Riverwalk/Rivergrove and SR-410 Flood Wall and Levee Right bank (RM 10.6-11.8)	Construct a flood wall	55	\$11,000,000
MP2	McCutcheon Road & 96th Street E. Road Barricade Right bank (RM 14.2-14.9)	Close road with immovable barricade during flood events and conduct post-flood repair	50	\$50,000
MP3	116th Street E. Point Bar Gravel Removal Left bank (RM 15.8-16.0)	Remove 13,700 CY gravel	33	\$220,000
MP4	McCutcheon Road & 128th Street E. Levee Setback Left and right bank (RM 16.7-17.4)	Construct setback levees on both left and right banks.	50	\$12,500,000 (per 2008 Levee Feasibility Study)
Upper Puyallup River				
UP1	Calistoga Setback Levee Right bank (RM 19.9-21.3)	Construct setback levee and reconnect 46 acres of floodplain	66	\$8,000,000- \$12,000,000
UP2	Ford Levee Setback Reach Gravel Removal Right bank (RM 24.0-24.4)	Remove 36,000 CY gravel and construct up to 12 engineered log jams	35	\$900,000
UP3	Neadham Road Flooding/Channel Migration Protection Right bank (RM 25.3-27.0)	Construct levee and engineered log jams (phase 1); acquire floodplain properties and abandon roadway (phase 2)	49	\$8,100,000
UP4	Orville Road Revetment at Kapowsin Creek Left bank (RM 26.2-26.4)	Property acquisition and demolition, removal of remnant levee and construction of engineered log jam/dolotimber revetment	50	\$1, 500,000
UP5	Orville Road Channel Migration Protection Left bank (RM 26.3-28.6)	Construct revetment and install engineered log jams; secondary option (and possible long-term solution) is relocation of Orville Road	49	\$17,300,000- \$38,000,000
UP6	Puyallup River/Orville Road Revetment and Riparian Habitat Restoration Left bank (RM 26.7-27.1)	Acquire floodplain properties, construct setback revetment along Orville Road, and install engineered log jams	50	\$3,700,000

Table ES 4 – Proposed Capital Improvement Projects

CIP#	Project Name/Location	Preferred Solution(s)	Score	Estimated Cost (2011 \$)
Lower White River				
LW1	State Street Flood Wall or Emergency Access Left bank (RM 0.2-0.3)	<i>Multiple Solutions:</i> Construct flood wall or acquire a nearby property and provide emergency access off SR-410 Traffic Ave. exit	53	Up to \$2,000,000
LW2	Lower White River Flood Protection Right and/or left bank (RM 1.8-4.9)	<i>Multiple Solutions:</i> Acquire floodplain properties, construct new levees, construct setback levees, and/or construct setback revetments (<i>*Project to be completed in multiple phases</i>)	TBD	\$28,627,000
LW3	Butte Avenue Levee/Berm Right bank (RM 4.9-5.5)	Construct a berm and levee	45	\$1,700,000
Upper White River				
None				
Greenwater River				
None				
Carbon River				
C1	Carbon Confluence Setback Levee Left bank (RM 0-0.4)	Construct setback levee	45	\$5,300,000
C2	Carbon Levee Bank Stabilization/Flow Deflection and Coplar Creek Backwater Improvements Left bank (RM 3.2-4.9)	<i>Multiple Solutions:</i> Construct engineered log jams and box culvert for Coplar Creek	48	\$2,700,000
C3	Alward Road Floodplain Acquisition Left bank (RM 6.0-6.4)	Acquire flood-prone properties	47	\$1,200,000
C4	Alward Road Floodplain Acquisition and Setback Levee Left bank (RM 6.4-8.3)	Acquire floodplain properties and construct setback levee	56	\$29,600,000
C5	Upper Carbon/Fairfax Road Bank Stabilization Left bank (RM 22.4-24.0)	Construct engineered log jams	48	\$1,500,000
South Prairie Creek				
SP1	South Prairie Floodplain Acquisition Right bank (RM 1.6-3.5)	Acquire floodplain properties	53	\$570,000
SP2	South Prairie Fire Station Flood Protection Left bank (RM 6.0)	Extend existing flood berm and install backflow prevention valve	50	\$27,000
Middle Nisqually River				
MN1	McKenna Area Floodplain Acquisition Right bank (RM 21.6-22.0)	Elevate existing residential structures and acquire flood prone properties	45	\$10,900,000
Upper Nisqually River				
UN1	Nisqually Park Levee Protection Right bank (RM 64.3-64.9)	Construct engineered log jam structures adjacent to existing levee	50	\$2,000,000- \$4,000,000
UN2	Upper Nisqually/Mt. Rainier National	Construct engineered log jam	61	\$2,500,000-

Table ES 4 – Proposed Capital Improvement Projects

CIP#	Project Name/Location	Preferred Solution(s)	Score	Estimated Cost (2011 \$)
	Park Revetment Retrofit/ELJs Right bank (RM 64.9-65.3)	structures adjacent to existing levee/revetment		\$3,500,000
Mashel River				
M1	SR-161 Mashel River Bridge Scour and Slope Repair Left bank (RM 5.2-5.3) and right bank (RM 5.5)	Construct bank roughening log structures	52	\$2,000,000- \$2,500,000
Total Project Costs				\$350,864,400- \$396,364,000

ES.6 PLAN IMPLEMENTATION AND FUNDING

Pierce County faces significant challenges in the years ahead. The aging system of flood risk reduction facilities, many of which were built in the 1960s or earlier, were built to a lower level of protection than what is now required to protect transportation, commercial, and residential structures. Many of these systems were designed to protect a less populated unincorporated area which has now incorporated into heavily populated cities and towns. Failure of these facilities could have significant and adverse impacts on public safety, public infrastructure, and private property along the rivers. In some areas, the dynamic nature of rivers, increases in sediment transport, channel migration, and more frequent and intense high flows are resulting in rising river beds, reduced river channel conveyance capacity, and increased flood risks.

Insufficient funds exist for proposed levee or revetment setbacks to increase flood conveyance capacity³⁰ and reduce downstream sediment transport, or for flood walls to protect critical facilities such as wastewater treatment plants. In addition, the environmental requirements resulting from the Endangered Species Act, Clean Water Act, and other legislation has significantly increased the difficulty and cost of maintaining flood risk reduction infrastructure.

ES.6.1 Plan Implementation

This Flood Plan and its proposed policies, projects, and programs are based on a premise that major-river flooding in Pierce County has regional impacts as well as localized impacts. Long term solutions require regional collaboration, partnerships, and funding. A regionally-focused approach to implementation offers the best opportunity for success in addressing flooding and channel migration risks.

Pierce County, in its regional role of providing services to reduce river flooding and channel migration risks, will provide leadership and build upon its long history of coordinating and partnering with local jurisdictions, tribes, state and federal agencies, and the public to reduce flood risks. Plan implementation will result in multiple public benefits, including reduction in

³⁰ **Conveyance Capacity** – A term generally referring to the maximum capability of the physical drainage system to safely transport water.

D. Trails Inventory

Table D-I: Trails Inventory

Trail Name	Existing Miles	Proposed Miles	Total Miles	Proposed Trail Class	Rail-to-Trail Project
Pierce County Trail Alignments					
Foothills Trail	26.1	-	26.1	Regional	*
<i>Foothills Trail - Carbonado to Cascade Junction (Wilkeson Section)</i>	<i>1.1</i>	<i>-</i>	<i>1.1</i>	<i>Regional</i>	
<i>Foothills Trail - Carbonado to Cascade Junction (Wilkeson to Carbonado)</i>	<i>2.1</i>		<i>2.1</i>	<i>Regional</i>	
<i>Foothills Trail - Carbonado to Cascade Junction (Wilkeson to Cascade)</i>	<i>3.7</i>		<i>3.7</i>	<i>Regional</i>	
<i>Foothills Trail - Mcmillin to Orting</i>	<i>3.1</i>	<i>-</i>	<i>3.1</i>	<i>Regional</i>	
<i>Foothills Trail - Merker Junction to McMillin</i>	<i>4.6</i>	<i>-</i>	<i>4.6</i>	<i>Regional</i>	
<i>Foothills Trail - Orting to South Prairie</i>	<i>7.3</i>	<i>-</i>	<i>7.3</i>	<i>Regional</i>	
<i>Foothills Trail - South Prairie to Buckley (Buckley)</i>	<i>0.3</i>	<i>-</i>	<i>0.3</i>	<i>Regional</i>	
<i>Foothills Trail - South Prairie to Buckley (Phase I)</i>	<i>1.3</i>	<i>-</i>	<i>1.3</i>	<i>Regional</i>	
<i>Foothills Trail - South Prairie to Buckley (Phase II)</i>	<i>1.6</i>	<i>-</i>	<i>1.6</i>	<i>Regional</i>	
<i>Foothills Trail - South Prairie to Buckley (Phase III)</i>	<i>1.1</i>	<i>-</i>	<i>1.1</i>	<i>Regional</i>	<i>*</i>
Grandview Trail¹	1.2	-	1.2	Combination	
<i>Grandview Trail - Cirque Dr to 64th St.</i>	<i>0.9</i>	<i>-</i>	<i>0.9</i>	<i>Regional</i>	
<i>Grandview Trail - Soundview Trail to Cirque Dr</i>	<i>0.3</i>	<i>-</i>	<i>0.3</i>	<i>Connector</i>	
Link - Cross Park to Train to the Mountain Rail with Trail	-	0.1	0.1	Connector	
Nathan Chapman Memorial Trail	1.6	-	1.6	Connector	
Soundview Trail¹	2.0	-	2.0	Connector	
Stewart Road Trail	-	0.4	0.4	Regional	
Total Pierce County	30.9	0.5	31.4		

¹ Property managed by Pierce County Public Works and Utilities

Trail Partnership Alignments					
Cross County Commuter Collector Trail	-	12.6	12.6	Regional	*
Cushman Power Line Trail	-	3.3	3.3	Regional	*
<i>Cushman Power Line Trail - Purdy to Borgen Blvd.</i>	<i>-</i>	<i>2.3</i>	<i>2.3</i>	<i>Regional</i>	
<i>Cushman Power Line Trail - Borgen Blvd. to 96th St NW</i>	<i>-</i>	<i>1.0</i>	<i>1.0</i>	<i>Regional</i>	
Eatonville to Rimrock Park Trail	-	1.5	1.5	Connector	
Link - Foothills Trail - Enumclaw Connector	-	1.8	1.8	Regional	*
Trail Linkage Tacoma Dome Station/Freighthouse Square	-	0.6	0.6	Combination	
<i>Trail Linkage Tacoma Dome Station/Freighthouse Square (north)</i>	<i>-</i>	<i>0.2</i>	<i>0.2</i>	<i>Regional</i>	
<i>Trail Linkage Tacoma Dome Station/Freighthouse Square (south)</i>	<i>-</i>	<i>0.4</i>	<i>0.4</i>	<i>Sub-regional</i>	
Train to the Mountain Rail with Trail	-	45.1	45.1	Regional	*
Total Partnership Projects	-	64.9	64.9		

ITALICIZED ROWS INCLUDED IN TOTAL. ALL MILEAGE IS APPROXIMATE AND IS NOT DERIVED FROM A SURVEY.

Table D-1: Trails Inventory

Trail Name	Existing Miles	Proposed Miles	Total Miles	Proposed Trail Class	Rail-to-Trail Project
Other Trail Alignments					
Ashford to Elbe Trail	-	8.1	8.1	Regional	*
Ashford to Rainier	-	6.4	6.4	Regional	
Chambers Creek/Lakewood Trail	-	4.5	4.5	Combination	
<i>Chambers Creek/Lakewood Trail</i>	-	4.1	4.1	Sub-regional	*
<i>Chambers Creek/Lakewood Trail</i>	-	0.4	0.4	Connector	*
Cushman Power Line Trail	4.9	-	4.9	Regional	
<i>Cushman Power Line Trail - 96th St NW to Pioneer</i>	2.1	-	2.1	Regional	
<i>Cushman Power Line Trail - Pioneer to Narrows</i>	2.8	-	2.8	Regional	
Cushman Power Line Trail - Spur North	-	7.1	7.1	Sub-regional	
Cushman Power Line Trail - Spur South	-	6.0	6.0	Sub-regional	
DuPont/Nisqually Trail	-	9.8	9.8	Regional	
Edgewood Interurban Trail	-	1.8	1.8	Sub-regional	*
Fennel Creek w/Loops	-	9.0	9.0	Combination	*
<i>Fennel Creek Trail</i>	-	2.2	2.2	Connector	
<i>Fennel Creek Trail</i>	-	2.7	2.7	Sub-regional	
<i>Fennel Creek Trail (Loop 1)</i>	-	2.7	2.7	Sub-regional	
<i>Fennel Creek Trail (Loop 2)</i>	-	1.4	1.4	Sub-regional	
Flume Trail	7.4	-	7.4	Combination	
<i>Flume Trail</i>	0.9	-	0.9	Connector	
<i>Flume Trail</i>	6.5	-	6.5	Sub-regional	
Fort Steilacoom Trails	1.4	-	1.4	Regional	
<i>Fort Steilacoom Trail (northwest)</i>	0.4	-	0.4	Regional	
<i>Fort Steilacoom Trail (southeast)</i>	0.9	-	0.9	Regional	
Graham Trail	-	7.7	7.7	Sub-regional	
Hylebos Trails	0.3	2.8	3.1	Sub-regional	
JEB III Trail - Dixie Gatchel Trail	-	0.9	0.9	Regional	*
Lake Tapps	-	0.3	0.3	Connector	
Lakeland Hills Trail	2.4	-	2.4	Combination	
<i>Lakeland Hills Trail</i>	0.9	-	0.9	Connector	
<i>Lakeland Hills Trail</i>	1.5	-	1.5	Sub-regional	
Link - I34 Ave E to the Puyallup River Trail	-	0.7	0.7	Connector	
Link - I44th St E to Foothills Trail	-	2.0	2.0	Regional	
Link - Foothills Trail to JEB III Trail - Dixie Gatchel Trail	-	0.8	0.8	Regional	
Link - Foothills Trail (Mt.Rainier Connector)	-	11.4	11.4	Regional	
Link - Foothills Trail to Train to the Mountain RWT	1.4	7.6	9.0	Regional	
<i>Link Foothills Trail to Train to the Mountain Rail with Trail (N. section one)</i>	-	2.4	2.4	Regional	
<i>Link Foothills Trail to Train to the Mountain Rail with Trail (N. section two)</i>	1.4	-	1.4	Regional	
<i>Link Foothills Trail to Train to the Mountain Rail with Trail (S. section)</i>	-	5.2	5.2	Regional	
Link - Schuster Parkway Trail to S Stadium Way	0.1	-	0.1	Connector	
Link - Train to the Mountain Rail with Trail to North Levee Trail	-	1.4	1.4	Regional	

ITALICIZED ROWS INCLUDED IN TOTAL. ALL MILEAGE IS APPROXIMATE AND IS NOT DERIVED FROM A SURVEY.

Table D-1: Trails Inventory

Trail Name	Existing Miles	Proposed Miles	Total Miles	Proposed Trail Class	Rail-to-Trail Project
Link - Univ. Place/Lakewood to Prairie Line Trail (east)	-	0.1	0.1	Connector	
Link - Univ. Place/Lakewood to Prairie Line Trail (west)	-	0.3	0.3	Connector	
Milton Interurban Trail	1.4	-	1.4	Sub-regional	
Narrows/Grandview Trail	1.9	6.0	7.9	Regional	
Nisqually River Trail	-	13.2	13.2	Regional	
North Levee Trail	-	9.1	9.1	Combination	
<i>North Levee Trail</i>	-	8.2	8.2	<i>Regional</i>	
<i>North Levee Trail</i>	-	0.9	0.9	<i>Connector</i>	
North Levee Trail Connector	-	0.3	0.3	Connector	
North Puyallup River Trail	0.7	0.5	1.3	Connector	*
NW Trek Wildlife Park to Nisqually-Mashel State Park	-	8.5	8.5	Regional	
Orting Bridge For Kids - Link to Foothills	-	0.8	0.8	Connector	*
Pacific Trail	-	1.1	1.1	Sub-regional	*
Perimeter Rd to I76th St S Trail	2.1	-	2.1	Regional	
Prairie Line Trail	0.3	2.0	2.3	Combination	*
<i>Prairie Line Trail</i>	-	1.0	1.0	<i>Connector</i>	
<i>Prairie Line Trail</i>	0.3	1.0	1.3	<i>Sub-regional</i>	
Puyallup River Trail	3.3	19.4	22.7	Combination	*
<i>Puyallup River Trail (Alderton)</i>	-	5.0	5.0	<i>Sub-regional</i>	
<i>Puyallup River Trail (McMillin to Orting)</i>	-	6.4	6.4	<i>Connector</i>	
<i>Puyallup River Trail (Sound to Puyallup)</i>	-	1.6	1.6	<i>Connector</i>	*
<i>Puyallup River Trail (Sound to Puyallup)</i>	-	4.6	4.6	<i>Regional</i>	
<i>Puyallup River Walk</i>	3.3	1.9	5.1	<i>Regional</i>	
Ruston Way	1.5	2.5	4.1	Regional	
Schuster Parkway Sidewalk/Trail	1.4	-	1.4	Regional	
Scott Pierson Trail	6.3	-	6.3	Regional	
Shoreline Trail	-	4.3	4.3	Regional	
Sumner Confluence Trail - Stuck & Puyallup	0.6	-	0.6	Connector	
Sumner Trail	0.2	-	0.2	Connector	
Tacoma's Julia's Gulch Trail	-	1.1	1.1	Connector	*
Thea Foss Esplanade	0.8	0.9	1.7	Regional	*
Trail to McKenna	-	15.2	15.2	Regional	*
University Place/ Lakewood Trail	-	2.1	2.1	Sub-regional	
Water Ditch Trail	3.2	3.4	6.6	Sub-regional	
White River Trail	2.6	12.9	15.5	Regional	*
<i>White River Trail (Auburn to Buckley)</i>	-	9.8	9.8	<i>Regional</i>	*
<i>White River Trail (Auburn)</i>	0.5	-	0.5	<i>Regional</i>	
<i>White River Trail (Sumner)</i>	2.1	3.1	5.2	<i>Regional</i>	
Williams Trail	-	1.5	1.5	Sub-regional	
Total Other Trails	44.2	193.7	238.0		
Total All Trail Alignments	75.1	259.1	334.2		

ITALICIZED ROWS INCLUDED IN TOTAL. ALL MILEAGE IS APPROXIMATE AND IS NOT DERIVED FROM A SURVEY.

E. Trail Providers

Table E-1: Trail Providers, Advocates and Plans

Municipality/ Jurisdiction	Planning Documents Relating to a Regional Trail			Website
	Document Title	Addresses Regional Trails	Provides Trail Classification	
City				
Auburn	2005 Auburn Parks, Recreation, and Open Space Plan	✓	✓	www.ci.auburn.wa.us
Bonney Lake	2007 Non-Motorized Transportation Plan 2007 Fennel Creek Corridor Plan	✓	✓	www.citybonneylake.org
Buckley	No planning document. City plans to extend portion of Foothills Trail	---	✓	www.cityofbuckley.com
Carbonado	---	---	---	n/a
DuPont	2007 DuPont Parks, Recreation, and Open Space Plan	✓	---	www.ci.dupont.wa.us
Eatonville	Eatonville Draft Trail System Plan	---	✓	www.eatonville-wa.gov
Edgewood	2005 Edgewood Interurban Trail Master Plan	✓	✓	www.ci.edgewood.wa.us
Fife	2008 Fife Parks, Recreation, and Open Space Plan	✓	✓	www.cityoffife.org
Fircrest	---	---	---	www.cityoffircrest.net
Gig Harbor	2004 Park, Recreation, and Open Space Plan	✓	---	www.cityofgigharbor.net
Lakewood	---	---	---	www.cityoflakewood.us
Milton	Coordinate with City of Edgewood's Interurban Trail Master Plan	✓	✓	www.cityofmilton.net
Orting	---	---	---	www.cityoforting.org
Pacific	Mostly in King County. Only a very small portion is in Pierce County	---	---	www.cityofpacific.com

Table E-1: Trail Providers, Advocates and Plans

Municipality/ Jurisdiction	Planning Documents Relating to a Regional Trail			Website
	Document Title	Addresses Regional Trails	Provides Trail Classification	
Puyallup	Puyallup Parks, Recreation, and Open Space Master Plan	✓	---	www.cityofpuyallup.org
Roy	---	---	---	www.cityofroywa.us
Ruston	---	---	---	www.rustonwa.org
South Prairie	---	---	---	www.townofsouthprairie.com
Steilacoom	---	---	---	www.steilacoom.com
Sumner	2008 Sumner Trail Master Plan	✓	✓	www.ci.sumner.wa.us
Tacoma	June 2008 draft Open Space Habitat and Recreation Plan	✓	---	www.cityoftacoma.org
University Place	2007 University Place PROS Plan	✓	---	www.ci.university-place.wa.us
Wilkeson	---	---	---	www.townofwilkeson.com
Park District				
Key Peninsula Metropolitan Parks (KeyPen)	2007 Key Peninsula Metropolitan Comprehensive Plan	✓	---	www.keypeninsulaparks.com
Metropolitan Parks Tacoma (Metro Parks)	2006 Metro Strategic Parks and Programming Services Plan	✓	---	www.metroparkstacoma.org
Peninsula Metropolitan Parks District (PenMet)	2006 PenMet Comprehensive Park, Open Space, and Recreation Plan	---	---	www.penmetparks.org
Anderson Island Parks & Rec. District	---	---	---	---

Table E-1: Trail Providers, Advocates and Plans

Municipality/ Jurisdiction	Planning Documents Relating to a Regional Trail			Website
	Document Title	Addresses Regional Trails	Provides Trail Classification	
County Community Planning Areas				
Alderton-McMillan	Alderton-McMillan Community Plan	✓	---	www.co.pierce.wa.us
Anderson and Ketrion Islands	---	---	---	www.co.pierce.wa.us
Browns Point/Dash Point	---	---	---	www.co.pierce.wa.us
Frederickson	Frederickson Community Plan	✓	---	www.co.pierce.wa.us
Gig Harbor Peninsula	Gig Harbor Peninsula Community Plan	✓	---	www.co.pierce.wa.us
Graham	Graham Community Plan	✓	---	www.co.pierce.wa.us
Key Peninsula	Key Peninsula Community Plan	✓	---	www.co.pierce.wa.us
Mid-County	Mid-County Community Plan	✓	---	www.co.pierce.wa.us
Parkland-Spanaway-Midland	Parkland-Spanaway-Midland Community Plan	✓	---	www.co.pierce.wa.us
South Hill	South Hill Community Plan	✓	---	www.co.pierce.wa.us
Upper Nisqually Valley	Upper Nisqually Valley Community Plan	✓	---	www.co.pierce.wa.us

Table E-1: Trail Providers, Advocates and Plans

Municipality/ Jurisdiction	Planning Documents Relating to a Regional Trail			Website
	Document Title	Addresses Regional Trails	Provides Trail Classification	
Counties				
Pierce County	County Comprehensive Plan, County Park Recreation and Open Space Plan, County Code, 2007 Buildable Lands Report, County-wide Planning Policies, Non-Motorized Transportation Plan	✓	---	www.piercecountywa.org
Thurston Co.	2007 Thurston Regional Trails Plan	✓	✓	www.trpc.org
Lewis Co.	---	---	---	fortress.wa.gov/lewisco/home
Mason Co.	Mason County Trail Master Plan	✓	✓	www.co.mason.wa.us
Yakima Co.	2008 Yakima Co. Trails Plan	✓	---	www.co.yakima.wa.us
King Co.	2004 Regional Trail Inventory and Implementation Guidelines	✓	---	www.metrokc.gov
Kitsap Co.	No regional trails plan (1996 Kitsap Co. Greenways Plan, 2005 Corridor Master Plan, 2001 Mosquito Fleet Trail Master Plan), 2001 Bicycle Facilities Plan	✓	---	www.kitsapgov.com

Table E-1: Trail Providers, Advocates and Plans

Municipality/ Jurisdiction	Planning Documents Relating to a Regional Trail			Website
	Document Title	Addresses Regional Trails	Provides Trail Classification	
Trails Interest & Other Agencies				
Green Tacoma Partnership (GTP)	Draft Open Space Habitat Plan	---	---	www.greentacomapartnership.blogspot.com
Cascade Land Conservancy	---	---	---	www.cascadeland.org
Forever Green Council	Updated 2008 Trail map	✓	---	www.forevergreencouncil.org
Foothills Trails Coalition	Trail related brochures	✓	---	www.piercecountytrails.org
Washington Wildlife and Recreation Coalition	List of trail funding options on website	✓	---	www.wildliferecreation.org
Washington Water Trails Association	List of water trails on website	✓	---	www.wwta.org
Washington State Parks / Trails	Washintgon State Trails Plan	✓	✓	www.parks.wa.gov
Nisqually National Wildlife Refuge	Final Comprehensive Conservation Plan	---	---	www.fws.gov/Nisqually
National Parks - Mt. Rainier	List of trails and trail maps in National Park	---	---	www.nps.gov/mora/planyourvisit/mount-rainier-maps.htm

F. Trail Plan Framework

Trail Planning Framework

Multiple planning documents and regulations guide growth and development in Pierce County. State, county, city and local planning efforts create layers of goals and policies. To prevent contradiction or conflict, this appendix provides an overview of planning efforts that relate to the Pierce County Regional Trails Plan (PC RTP).

Washington State Trails Plan

The State Recreation and Conservation Office (RCO) is responsible for the Washington State Trails Plan. Accepted by the National Park Service in 1991, the Plan is an element of the Statewide Comprehensive Outdoor Recreation Planning (SCORP) program. The Plan establishes a number of trail related goals and identifies different trail users. Specific goals related to the Pierce County Regional Trails Plan include:

Develop new trails and paths in city and county jurisdictions;
Connect trail systems and populated areas via trails and paths; and
Increase the miles of trail available in semi-primitive and other remote settings.

Trail Settings

The Washington State Trails Plan classifies trails by the setting that trail users prefer, which can range from primitive to urban. These trail settings can be restricted or designed for one specific use, or they may be designed for different types of uses (a multi-use trail). The State also identifies water trails as a distinctive trail type. As defined in the State Trail Plan, trail settings include:

- **Primitive.** The most remote parts of the forest where you will meet few if any people. Access is by cross-country travel or by trails. No motorized use is allowed. Recreation facilities are generally not provided.
- **Semi-Primitive.** Mainly a natural setting where you will occasionally meet other people. Access is by trails, although some primitive roads may exist. Motorized vehicles are generally prohibited. Few recreation facilities are provided, and those that exist are minimal and rustic.
- **Roaded Modified.** Nature has obviously been altered by logging, mining, farming, or grazing. Many roads and some developed campgrounds exist. You will meet other people in cars, trucks, and

motorbikes. You may be able to get away from others in remote camp spots.

- **Roaded Natural.** Forest, range, and coastal settings that look natural or slightly altered. Access is by trail, road, and highway. Recreation facilities such as developed campgrounds may exist. There may be opportunities to camp away from other people with no facilities.
- **Rural.** Farms, forests, and other managed lands that provide a sense of open space but not necessarily a natural appearance. Access is by trail, road, and highway. There will be many fences, with moderate to sparse populations.
- **Urban.** Cities, towns, large resorts, and major ski areas with buildings, paved roads, and lots of people. Many developed recreation facilities and easy vehicle access.
- **Water Trails.** Provides a route or path to, on, or along a body of water. Water trails serve as a route linking water-accessible camps and havens for non-motorized watercraft.

Trail Users

The State Trail Plan planning process used a number of public involvement techniques to identify and categorize trail users and their preferred trail settings. The purpose is to show that different trail users have different preferred trail settings. The following provides a list of trail users identified in the State Trail Plan, including the preferred trail setting.

- **Hiking-Walking.** Hikers/walkers prefer less developed settings, especially the semi-primitive and primitive.
- **Road Bicycling.** Road bicyclists typically prefer roaded settings outside of cities and towns and other developed areas where there is less vehicular traffic.
- **Mountain Bicycling.** Because mountain bikes can be used on the road, for commuting, or on an off-road trail, the preferred setting is varied. The State Trail Plan indicates the urban setting is most preferred. It can be assumed that semi-primitive and roaded modified trail settings are also popular among recreational mountain bikers.

- **Pack and Saddle.** Equestrian related trail users prefer roaded settings outside of cities and towns and other developed areas where there is less vehicular traffic.
- **Off-Road Vehicles.** Off-road vehicle trail users typically prefer roaded modified and roaded natural settings.
- **Cross-Country Skiing and Snowshoeing.** The State Trail Plan indicates that the urban setting is most preferred. The Plan suggests that this may be due to the increasing popularity at developed ski sites that offer groomed trails.
- **Snowmobiling.** Similar to cross-country skiing and snowshoeing, the State Trail Plan identifies the urban setting as the most preferred among snowmobilers.
- **Watercraft (Water trails).** Preferred settings for watercraft and boating were not included in the State Trail Plan. Existing water trails follow river banks and shorelines, while destinations primarily include camps or havens for non-motorized watercraft. These trail types are identified in the following section.

Pierce County Planning Policies

As required by the State of Washington, Pierce County has adopted Countywide Planning Policies, or written policy statements that are used for establishing a countywide framework from which the county and municipal comprehensive plans are developed and adopted. The framework is intended to ensure that the county and municipal comprehensive plans are consistent, as required by the Washington statutes. Specific policies that relate to a regional trail system in Pierce County include:

- Require non-motorized facilities as part of the transportation network; and,
- Provide facilities to encourage alternatives to automobile travel and/or to reduce the number of vehicle miles traveled including non-recreational bicycle facilities.

Pierce County Comprehensive Plan (1994):

Developed in response to the requirements of the Washington State Growth Management Act, the Plan integrates citizen's ideas, concerns and preferences into statements of how the county should be developed, what development regulations should accomplish, what facilities and services levels are needed, and how publicly-funded improvements should support these objectives. The Comprehensive Plan is codified as Title 19A of the Pierce County Code. Section 19A.30.160 deals with recreation and Section 19A.30.170 addresses open space. The County Comprehensive Plan has two goals and several more specific objectives and criteria related to trails. The goals related to trails include the following.

- Transportation - Encourage efficient multimodal transportation systems that are based on regional priorities and coordinated with county and city comprehensive plans.
- Open Space and Recreation - Retain open space, enhance recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities.

County Code

Pierce County's Code contains the requirements for the official establishment of the Parks and Recreation Services Department, along with regulations regarding the park and recreation system. Title 14 of the Code addresses parks and recreation. Chapter 2.96 in Title 2 addresses the establishment of the Conservation Futures Program. Title 4A specifies impact fee requirements. Title 19E contains a six-year financing plan for capital facilities, including level of service (LOS) standards for parks and recreation facilities. Title 14 also provides code provisions for the "Adopt-A-Trail Maintenance Program" which allows volunteer organizations to maintain portions of county trails.

Trail requirements are discussed in Title 18J: Development Regulations. This section of code provides development requirements and regulations for nine of the eleven community planning areas. Section 18J.15 discusses County-wide design standards. Several of the community planning areas have similar requirements for trails. Some of these common elements include:

- Identification of trails and trail system development application;
- Require connection of trails to other parks and trails where possible;

- Trails shall be at least 3.5-5 feet in width and made of a pervious surface; and
- Mandatory trail dedications shall be required when the site is within or adjacent to an identified trail alignment.

Park, Recreation, & Open Space Plan (2008)

Pierce County's recently adopted Park, Recreation & Open Space Plan creates a vision for the county park system, recreation facilities, programs, and services. It addresses the recreation needs of residents county-wide, while reflecting diverse community priorities within Pierce County. The Plan establishes specific goals, objectives, recommendations, and actions for developing, conserving, and maintaining quality parks, trails, facilities, and open space. In addition, the Plan recommends a strategy for the implementation of capital and non-capital projects that will most benefit the community. The plan's vision also calls out an interconnected system of parks and recreation services. Of the plan's ten goals, Goal 2 speaks directly to trails.

- Goal 2: Provide a regional system of off-street trails and corridors that links parks, open spaces, significant environmental features, public facilities, and areas of interest.

Non-Motorized Transportation Plan (1997)

This plan is based from policies within the Pierce County Transportation Plan and Transportation Element of the Comprehensive Plan, which calls for a non-motorized transportation plan. The plan was developed with the Pierce County Regional Trails Advisory Commission and the Public Works and Utilities Department and contains a vision statement and policies that were to later be codified into the County Code and Design Standards. The Plan also identifies projects related to non-motorized transportation improvements. Almost all of the numerous policies relate to the regional trail system. Some of the key themes of the policies that relate to the PC RTP include:

- Provide a system that is safe and accessible to a variety of users;
- A system that supports improved personal mobility and reduced traffic congestion; and
- A regional system that is coordinated with adjacent jurisdictions and public transit.

Park Districts

All of Pierce County's park districts have adopted a park and recreation related plan. Similar to city and county plans, park district plans contain policies and goals related to connectivity to neighboring communities, and coordination among affected agencies and user groups.

Key Peninsula Metropolitan Parks

The 2007 Key Peninsula Metropolitan Comprehensive Park Plan contains several goals related to the PCRTP. These include:

- Enhance water access for non-motorized water craft users.
- Create off-road walking trail and on-road bike route networks accessing historic areas, scenic vistas, parks, public facilities, and business districts, that link to regional routes to provide greater access and recreation opportunities for local resident hikers, tourists, and bicyclists of all levels.
- Create an interconnected off-road multipurpose hike, equestrian, and bike trail system providing access to major parks, schools, public facilities, business districts, and other trail corridors.

Metro Parks Tacoma

Metro Parks Tacoma adopted the Metro Strategic Parks and Programming Services Plan in 2006. The Plan calls for several action items that relate to the PCRTP. These include:

- Provide public access to the Puget Sound for water-related recreation and trail uses, including boating facilities along Thea Foss Waterway, Ruston Way, Point Defiance Park and other community parks.
- Provide internal pathways connecting park elements in all parks.
- Seek opportunities to connect neighborhood parks to nearby schools, libraries, community centers, etc.
- Coordinate trail planning efforts with public agencies such as City of Tacoma, Pierce County and Washington State Department of Transportation, to ensure that city and regional trails connect with major destinations, such as community and regional parks, greenspace, community centers, schools, libraries, business districts and transportation centers.

Peninsula Metropolitan Park District

The Peninsula Metropolitan Park District (PenMet) is guided by the Comprehensive Park, Open Space, and Recreation Plan, 2006. The Plan provides a park system inventory, and outlines park related issues and opportunities. The Plan also establishes several goals related to the future of the park district. The plan recognizes the significance of a regional trail, there are two goals related to the PC RTP, including:

- Provide park and recreation opportunities for our constituents through partnerships with Peninsula School District, City of Gig Harbor, Pierce County, Washington State, Key Peninsula Metropolitan Park District, and other public agencies or private organizations.
- Acquire land, facilities, and other park assets necessary to provide high quality recreational opportunities.

In addition to the above stated goals, Section 2 pgs 2-6, there are several references to: Partnering with Pierce County & "...continued development of the Cushman Trail and at least two east-west connections across the Gig Harbor Peninsula." Section 3A-93 references the Cushman Trail and "Trail corridors provide access to park sites, environmental areas, as well as community facilities, commercial districts, and residential neighborhoods. Trail corridors are linear parks that may have local as well as regional significance."

Community Plans

The purpose of a community plan is to provide a local voice for how a community will comply with the county's Comprehensive Plan and its development regulations. Community plans will exemplify how the objectives and policies of the Comprehensive Plan play out when applied to detailed and specific conditions. Pierce County identifies several community areas in various geographic urban, suburban, and rural areas of unincorporated Pierce County. Currently, eleven of these community areas have developed plans that include strategies for providing and maintaining parks and open space. Once adopted, a community plan is considered to be a direct amendment to the Comprehensive Plan. All of the adopted community plans have specific goals, objectives, or action items that call for a regional network of trails. (Adoption dates are noted in parenthesis where applicable).

- **Alderton-McMillan Community Plan:** This community planning area is situated between Bonney Lake and Puyallup, south of the City of Sumner and northeast of the City of Orting. An upland area west of the City of Bonney Lake is also included. Plan policies that relate to the PCRTP include:
 - Explore interests and concerns of surrounding communities and others related to expanding a trail system in the area.
 - Pierce County Parks should evaluate the feasibility of connecting the Foothills Trail with the Bonney Lake trail system.
 - A community trail system should strive to connect public river access areas along the Carbon and Puyallup Rivers.

- **Anderson and Ketrion Islands Community Plan:** The planning area covers both Anderson and Ketrion Islands, which are located in Puget Sound. Draft plan recommendations involve areas within the Town of Steilacoom, as related to the ferry dock that provides the sole method of access to both islands. Although results of the planning process indicate the desire to plan for an efficient transportation system, draft goals do not specifically identify connection to a regional trail system.
 - Browns Point/Dash Point Community Plan: This planning sub-area is located in northern Pierce County, bordered by the cities of Tacoma and Federal Way and situated on the eastern side of Commencement Bay. This community is located entirely within the urban growth area. The plan identifies one objective that relates to the PCRTP:
 - Develop a trail linkage that safely connects the Browns Point and Dash Point areas along SR-509.

- **Frederickson Community Plan:** Frederickson is centrally located in Pierce County between Spanaway and South Hill. The plan area encompasses approximately 8,000 acres (12.5 square miles). Elements of the Plan that relate to the PCRTP include the transportation portion of the community plan vision, which states:
 - “Non-motorized transportation facilities including sidewalks, pathways, and trails will be planned and systematically developed within the community so that in the future

residents can travel to schools, parks, commercial areas, and other destinations safely without relying upon the automobile.”

- **Gig Harbor Peninsula Community Plan:** This planning area covers 37,120 acres (58 square miles) in northwestern Pierce County, including the Gig Harbor Peninsula and Fox Island. It is located west of the Tacoma Narrows Bridge, north to Kitsap County and east of Burley Lagoon and the Purdy Bridge. Puget Sound marine waters surround the area on three sides. The Plan recommends trail connectivity to the community of Purdy, as well as other more local connections. The Plan relates to the efforts of the PC RTP through one of the plan policies.
 - Link trail systems on the Longbranch Peninsula, in Kitsap County and the regional trail system on the east side of the Tacoma Narrows Bridge.

- **Graham Community Plan:** Graham is located in south central Pierce County at the fringe of the county’s urban growth area. The planning area encompasses approximately 48,640 acres (76 square miles) and is bounded on the north by the communities of Spanaway, Frederickson, and South Hill, on the west by Fort Lewis, and on the east by the City of Orting and the community of Alderton-McMillan. The City of Eatonville is located about four miles south of the Graham planning area. Several of the Plan policies directly relate to the PC RTP and include:
 - Provide a community-wide system of trails for non-motorized transportation, nature viewing, and passive recreation.
 - The trail system should extend through the plan area and connect with the county’s regional trail system in the Orting Valley.
 - The trail system should reflect the trail corridors included in the Forever Green Council’s recommendations regarding regional and countywide trail connections spanning from the Cascade Mountains to Puget Sound.
 - Require the dedication of regional trails during the site development process.

- **Key Peninsula Community Plan:** This planning area is located in northwestern Pierce County, bordered by Kitsap County on the north and Mason County on the west. It is surrounded on three sides by Puget Sound water, including the Henderson Bay, North Bay, Case Inlet, and Carr Inlet. The Key Peninsula Community Plan is particularly focused on a regional trail system. Some of the policy statements that relate to the PC RTP include:
 - Develop a community-wide system of recreational trails. The system of trails should link neighborhoods with parks, school sites, and other public property. Public lands and existing rights-of-way should be used for trail purposes whenever feasible.
 - A community-wide system of public trails should be created to complement the non-motorized transportation system.
 - The trail system on the Key Peninsula should eventually be linked with trail systems on the Gig Harbor Peninsula, in Kitsap and Mason counties, and the regional trail system on the east side of the Tacoma Narrows Bridge.
 - Partner with Tacoma Public Utilities to develop an east-west regional trail segment within the Tacoma-Cushman transmission corridor/144th Street KPN right-of-way.

- **Mid-County Community Plan:** The planning area is located in south central Pierce County at the fringe of the county's urban growth area. The area is bordered by the City of Tacoma and the communities of Midland and Parkland to the west, the City of Puyallup and South Hill to the east, the City of Fife to the north and Frederickson to the south. The planning area encompasses 14,652 acres (23 square miles) of rural, urban, and natural resource lands. The Plan identifies several potential trail segments and policies that relate to the PC RTP including:
 - Design a trail system to connect with regional trail systems that exist or are planned in the surrounding communities of South Hill, Frederickson, Midland, and the Cities of Puyallup and Tacoma. Priorities for new trail development include the Tacoma Pipeline Road regional trail, Tacoma Rail regional trail, 112th Street and Canyon Road non-motorized bicycle and pedestrian improvements.

- **Parkland-Spanaway-Midland Community Plan:** The Parkland-Spanaway-Midland (PSM) Communities Plan area encompasses approximately 13,003 acres (20.3 square miles) and is located in west-central Pierce County. The planning area is bounded on the north by the City of Tacoma, the west by the City of Lakewood, McChord Air Force Base, and Fort Lewis, on the south by Fort Lewis, and on the east by the Summit-Waller/North Clover Creek and Frederickson Community Plan areas. Policies outlined in the Plan that relate to the PC RTP include:
 - Provide a community-wide system of trails for non-motorized transportation, nature viewing, and passive recreation.
 - Maintain the countywide level of service for regional linear trails (major trails) within the plan area.
 - Address the current 34.1 acre regional linear trail deficit occurring within the plan area in the next annual update to the Capital Facilities Plan.
 - Within the next six years, amend the Capital Facilities Plan to address the projected additional 2.9 acre regional linear trail deficit within the plan area.

- **South Hill Community Plan:** South Hill is centrally located in Pierce County and encompasses approximately 12,160 acres (19 square miles). The community is known as South Hill due to its location south of the valley containing the City of Puyallup and west of the valley containing the City of Orting. The Plan relates to the efforts of the PC RTP through the following policy:
 - Design the trail to connect to regional trail systems that exist or are planned in surrounding communities such as the City of Puyallup, Frederickson, and the Orting Valley. Coordinate trail design and seek funding opportunities jointly with surrounding communities such as the City of Puyallup, Frederickson, and Orting.

- **Upper Nisqually Valley Community Plan:** The Upper Nisqually Valley consists of approximately 27,000 acres (42.2 square miles) in southeast Pierce County, including the communities of Alder, Elbe, and Ashford and terminating at the Nisqually entrance to Mt. Rainier National Park. Roughly 50% of this area is public land held by the Federal, State, or local

government. The majority of the public lands are designated forests which provide significant recreational opportunities and conservation of wildlife habitat. The specific plan policy that relates to the PC RTP includes:

- Develop a barrier-free trail system for walkers, hikers, and cyclists that provides access to the Nisqually River, public lands, and the National Park along the trail system.

City and Town Planning Efforts

Several cities and towns in Pierce County have adopted trail related plans, or have existing or planned trails within their jurisdictions. Of Pierce County's cities and towns, nine have adopted a plan related to trail development and four have either drafted a trail related plan or are in the process of trail development. Several of these communities have identified specific trail classifications as well as trail design standards. All of these communities identify the need for a regional trail network, or trail connectivity to neighboring destinations.

Auburn

The 2005 Auburn Parks, Recreation, and Open Space Plan calls for a network of trails that provides connections to surrounding communities. The city continues to participate in development of countywide and regional trail systems, including the Interurban, Lakeland Hills, and White River Trails. The city also participates in planning for regional trails in South King County.

Regional Trail Planning Policies

- A network of trails created or extended to provide adequate coverage for both commuting and recreational cyclists. Locations for east/west trails shall be identified and developed. Acquisition of land for the proposed Green River Trail shall continue to be a priority.
- The city should participate in planning activities for regional trails in South King County and North Pierce County. Explore possibilities for new trail connections between neighboring communities.

Identified Regional Connections

- Surrounding communities.
- Interurban and Green River Trails.

Trail Classifications and Design

- Recreational Loop Trails – shared-use, hard or soft surface.
- Linear Trails – shared-use, hard surface.
- Recreation/Transportation Trails – shared-use, hard surface, accommodate two-way traffic.
- ADA and AASHTO guidelines.

Planning Horizon – 2020.

Bonney Lake

The City of Bonney has two documents that discuss trail planning. The 2007 Non-Motorized Transportation Plan (NMTP) calls for connectivity to recreational and open spaces. The 2007 Fennel Creek Corridor Plan (FCCP) includes plans to connect its 4.5-mile portion of the Fennel Creek Trail with the Foothills Trail. Inside the city limits, the Fennel Creek Trail is planned to connect Allan Yorke Park to the Foothills Trail and the future Pierce County Flume Trail. Outside of the city, the trail is planned to connect with the Foothills Trail, Flume Trail, and Ehli Rim Road Loop.

Regional Trail Planning Policies

- Map the location of the proposed trail and connections to local sidewalks, feeder trails, and the Foothills Trail system.

Identified Regional Connections

- Allan Yorke Park, Flume Trail, Ehli Rim Road Loop, Pierce County Foothills Trail via Fennel Creek.

Trail Classifications and Design (NMTP)

- Designated Bicycle Routes (Class III Bikeway).
- Shared Roadway (Class II Bikeway).
- Shared-Use Path (Class I Bikeway).
- ADA and AASHTO standards.

Trail Classifications and Design (FCCP)

- Standard Trail Section – paved, 12' width.
- Equestrian Trail – 2' width, native soil, woodchips or sand, separated from standard section minimum of 5'.
- ADA guidelines.

Planning Horizon – Not specified

Buckley

Through a grant from the Washington Wildlife and Recreation Coalition in 2005, the City of Buckley plans to complete development of the regional Foothills Trail within its city limits. The city has no formal trail plan. This project will extend the trail north from the Armory along the abandoned railroad grade alignment (now owned by the city) to the southerly boundary of the Puget Sound Energy's flume. The trail will parallel the flume eastward to the River Avenue right-of-way, where it will cross the flume using the old highway bridge, then continue north on the River Avenue right-of-way to the south side of the White River. This Foothills Trail segment will end at Riverside Park.

Regional Trail Planning Policies – The city has no formal trail related plan.

Identified Regional Connections

- Existing portion of the Foothills Trail.

Trail Classifications and Design

- Paved, 11' width.
- ADA guidelines.

Planning Horizon – Not applicable.

DuPont

Goal 5 of the 2007 DuPont Parks, Recreation, and Open Space Plan discusses a comprehensive network of trails and pathways, and linkages with the regional trail system, with connections to regional points of interest, such as the Nisqually National Wildlife Refuge. The Plan identifies 14 potential trail alignments throughout the city. The plan outlines several trail design guidelines, although no trail classifications are provided.

Regional Trail Planning Policies

- Pursue a regional trail linkage to Nisqually Wildlife Preserve.
- Provide linkages throughout the community, to Puget Sound and other natural resources, and to regional destinations.

Identified Regional Connections

- Entire frontage of Puget Sound.
- Nisqually National Wildlife Refuge.

Trail Classifications and Design – Not specified.

Planning Horizon – 2013.

Eatonville

Eatonville's Draft Trail System Plan outlines a regional trail system with connections to Mt. Rainier National Park, surrounding cities, existing trails, and other nearby destinations and attractions.

Regional Trail Planning Policies

- Integrate the Eatonville trail system with other existing area and regional trails.

Identified Regional Connections

- The communities of Elbe, Ashford, Alder, Mineral, Morton, Orting, Graham, and Yelm.
- Pack Forest (University of Washington).
- Northwest Trek Wildlife Park.
- Future Nisqually River State Park.
- Alder Lake Campgrounds and Day Use Area.
- Pioneer Farm and the Ohop Valley.
- Elbe Hills (Department of Natural Resources).
- Ohop Lake, Clear Lake, Silver Lake, Mineral Lake, and Lake Kapowsin.
- Mount Rainier National Park.
- Bald Hills/Clear Lake (south of Nisqually River).

Trail Classifications and Design

- Sidewalks and bike lanes.
- Paved trails – multi-use asphalt trails separated from motorized vehicle traffic in an independent right-of-way.
- Forest roads – gravel logging roads designated by signs suitable for walking, bicycling, and/or equestrian use.
- Hiking trails – dirt foot paths for hiking and backpacking.

- Interpretive trails – short loop trails with interpretive features (signs or brochures) explaining natural and/or cultural features found along the trail.
- Water trails (put in/take out sites).

Planning Horizon – Not specified

Edgewood

The City of Edgewood plans to connect to the City of Pacific and Sumner, through completion of the Interurban Trail. The 2005 Interurban Trail Master Plan establishes a trail network that will join Edgewood with the Pacific and Sumner portions of the Interurban Trail.

The Edgewood Interurban Trail project encompasses the remaining 2.66 miles of the historic Seattle to Tacoma Interurban Electric Railway Line right-of-way that runs through the City of Edgewood as well as the connecting segments of trail corridor in the City of Milton and City of Pacific. This trail corridor will link the regional trail system of converted historic Interurban rail-to-trail and Green River Regional Trails that will link key urban centers and areas of southern King County and Northern Pierce County.

Regional Trail Planning Policies

- Completion of missing gap(s) in regional trail systems.
- Coordination with adjoining cities and approving agencies needed to make the linkages possible.

Identified Regional Connections

- Cities of Pacific, Fife, Tacoma, and King County.

Trail Classifications and Design

- Typical trail section (Class 1 Trail/Bikeway) – paved, shared-use, 12' width.
- Non-typical trail sections:
 - Jovita Canyon/Bluffs Slopes Trail Section – Similar to Typical Trail standards with a width of 10' to account for topography.
 - Equestrian Trail Section – adjacent to paved trail, minimum 2' wide shoulder.
- WSDOT, FHWA, AASHTO and ADA design guidelines for Class 1 trails.

Planning Horizon – 2030

Fife

The City of Fife’s recently adopted 2008 Park, Recreation, and Open Space Plan identifies several trails that provide connectivity to the region. The plan contains specific trail design standards, and specifies a goal to extend the Interurban Trail through the community.

Regional Trail Planning Policies

- Create a network of interconnected, multipurpose non-motorized trails for walking, hiking, cycling and to promote connectivity between parks, neighborhoods and public amenities.
- Extend the Interurban Trail through the Gathering Place to the Fife Community Center.

Identified Regional Connections

- Cities of Edgewood and Tacoma.
- Interurban Trail.

Trail Classifications and Design

- Regional trail – paved, shared-use, 12-14’ width.
- Community trail – paved, shared use, 8-10’ width.
- Rustic trail – earthen or soft surface.
- Bike routes and sidewalks.
- Rail trail.

Planning Horizon – 2027

Gig Harbor

Gig Harbor’s 2001 Park, Recreation, and Open Space Plan includes specific goals that call for a network of trails throughout the city and beyond. The Plan calls for collaboration with Pierce County, Tacoma, the Washington State Department of Transportation, and other appropriate jurisdictions to link and extend Gig Harbor trails to other community and regional trail facilities.

Regional Trail Planning Policies

- Develop a multipurpose trail system on the powerline and Swede Hill/SR-16 right-of-way to provide effective support to regional and local resident interests.
- Create a comprehensive system of multipurpose off-road trails using alignments of the Bonneville Power Administration's (BPA) powerline and SR-16 rights-of-way where appropriate.
- Work with Pierce County, Tacoma, the Washington State Department of Transportation, and other appropriate jurisdictions to link and extend Gig Harbor trails to other community and regional trail facilities.

Identified Regional Connections

- Key Peninsula.
- Kitsap County.
- The Tacoma Narrows Bridge.
- The Mount Rainier/Nisqually Delta Trail through Tacoma and Steilacoom.

Trail Classifications and Design – Not specified

Planning Horizon – 2007

Milton

Based on the Interurban Trail Plan, the City of Milton prioritizes a trail that will extend beyond the corporate boundaries of the City of Milton. Through a grant from the Washington Wildlife and Recreation Coalition in 2003, the city will acquire 19.88 acres of the abandoned Interurban Railroad right-of-way, along with an existing 1.74 mile city-owned right-of-way, to develop a regional trail network. The trail will ultimately connect west through the City of Fife, to the Port of Tacoma, westward to the Tacoma waterfront, and east through the City of Edgewood, into the Sumner Pacific Trail, and ultimately northward through the Kent Valley, into the King County Regional Trail Network.

Regional Trail Planning Policies – The city has no formal plan related to trails.

Identified Regional Connections

- Cities of Tacoma, Edgewood.
- Sumner Pacific Trail.
- Kent Valley.

- King County Regional Trail Network.

Trail Classifications and Design – Not specified.

Planning Horizon – Not applicable.

Puyallup

The 2008 Puyallup Parks, Recreation, and Open Space Plan promotes a network of off-street trails using natural open space areas, parks, utility corridors, and other features. The Plan promotes the development of a non-motorized circulation system providing access to park and recreation facilities. The Plan identifies numerous trail segments including the Riverwalk Trail, the Puyallup Loop Trail, Walk the Valley Routes, and linkages to the Foothills Trail.

Regional Trail Planning Policies

- Promote the development of trails for bicycle and pedestrian recreational and commuter use, linking community activity areas and focusing on areas suited to interpretive activities and facilities.
- Tie Puyallup's trail network into Pierce County's regional trail network, and prioritize completing a connection to the Foothills Trail.
- Promote a network of off-street trails using natural open space areas, parks, utility corridors, and other features.

Identified Regional Connections

- Foothills Trail.

Trail Classifications and Design

- ADA Standards.

Planning Horizon – 2014.

Sumner

The 2008 Sumner Trail Master Plan identifies a system of separated, multi-purpose trails that will connect with adjacent communities to facilitate regional connectivity. Together, Sumner and Pacific prepared and adopted a Trail Master Plan in 1996. The Plan was later amended to show alternate trail routes and connections, including the Edgewood Interurban Trail. The

proposed Sumner Trail is planned to link four major regional trails: Foothills Trail, Puyallup River Trail, Interurban Trail, and White River Trail.

Regional Trail Planning Policies

- Develop a trail system connecting to similar trails to the west, north and south for recreation and transportation purposes.

Identified Regional Connections

- Cities of Puyallup, Sumner, Auburn, Pacific, Edgewood.
- Interurban Trail.
- Foothills Trail.
- Puyallup River Trail.
- White River Trail.

Trail Classifications and Design

- Class I bikeway (Primary trail) – Paved, separated, 12’ width.
- Class II bikeway (Bike lane) – Striped bike lane in public right-of-way.
- Class III bikeway (Bike route) – Signed bike route in public right-of-way.
- Secondary trail – soft surface, separated 8’ width.
- Social footpath – soft surface, narrow walking path.
- WDOT standards for Class II bikeways.
- ADA standards.

Planning Horizon – Not specified.

Tacoma

Tacoma’s trail system is guided by Metro Parks Tacoma, and Tacoma’s Open Space Habitat and Recreation Plan Draft. The Plan calls for coordinating trail planning efforts with public agencies to ensure that city and regional trails connect with major destinations, such as community and regional parks, habitat areas, schools, libraries, business districts and mixed-use centers. The Plan identifies the need to provide trails and trail corridors both within open space lands, connect destinations across the city, and create trail linkages with regional trail systems.

Regional Trail Planning Policies

- Develop or partner with others to provide trails and trail corridors both within open space lands and connecting destinations across the city, and create trail linkages with regional trail systems. Coordinate trail planning efforts with public agencies to ensure that city and regional trails

connect with major destinations, such as community and regional parks, habitats areas, schools, libraries, business districts and mixed-use centers.

- Develop opportunities for public access to the Puget Sound for water-related recreation and recreation along shorelines and within the water.

Identified Regional Connections – Not specified, although plan recommends regional coordination.

Trail Classifications and Design – Not specified.

Planning Horizon – 2014.

University Place

The 2007 University Place Parks, Recreation, and Open Space Plan Update encourages the connection of parks, open spaces and greenbelts. The Plan does not specify trail design standards or preferred alignments.

Regional Trail Planning Policies

- Encourage the connection and linkage of parks, open spaces, and greenbelts.

Identified Regional Connections

- Along frontage of Puget Sound.

Trail Classifications and Design

- ADA standards.

Planning Horizon – 2012.

Neighboring Counties

Pierce County is surrounded by six counties. King, Mason, Thurston and Yakima Counties all have adopted county-wide trail master plans. Lewis County does not currently have an adopted plan related to trail planning. Kitsap County has several trail-related plans including the Bicycle Facilities Master Plan, the Greenways Plan, The Mosquito Fleet Master Plan and the Corridor Master Plan. However, these documents are related to specific design elements or specific areas and do not set forth region-wide goals related to a regional trail.

King County

King County has an extensive trail network and a long history of trail planning. The county adopted its first trails plan in 1971. Currently, the county bases its trail planning priorities on the 2004 Regional Trail Inventory and Implementation Guidelines. The document focuses on specific trails, gaps in the trail network, and long-range improvement strategies. Some of the trails specified in the document are adjacent to Pierce County. Trails, such as the section between the cities of Pacific and Milton, specifically call-out Pierce County as a key partner. The document identifies other potential trail alignments linking the cities of Federal Way and Enumclaw with Pierce County.

Regional Trail Planning Policies

- Connect existing trails into a system that will interconnect the communities of King County with each other as well as tie in the major recreational attractions. Such a system would primarily serve the citizens of King County and make connections to other opportunities beyond its borders.

Identified Regional Connections

- Cities of Auburn, Pacific, Edgewood.
- Green River Trail.
- Interurban Trail.
- Foothills Trail.

Kitsap County

To the west of Pierce County, Kitsap County has a network of on and off-street pedestrian and bike routes. In 2001 the county adopted the Mosquito Fleet Trail Master Plan which focused on trail planning along the eastern shoreline of Kitsap County. More recently the county developed a non-motorized transportation system report to address non-motorized transportation needs County-wide. The county also developed the 2001 Bicycle Facilities Plan. The plan contains goals and policies related to bicycle facilities throughout the County, including a goal that calls for regional connectivity.

Regional Trail Planning Policies

- Develop a system of non-motorized transportation facilities primarily in the public right-of-way that provide safe transportation between a

variety of regional, inter-community and local destinations for bicyclists and pedestrians

- Provide bicycle connections to regionally significant destinations.
- Coordinate with the Pierce County to provide a continuous bicycle system.

Mason County Trail Master Plan

Mason County borders Pierce County to the west. The vision for the Mason County Regional Trails Plan is to cultivate a public and systematic approach to developing trails and bikeway systems in Mason County that include on- and off-street facilities linking communities, neighborhoods, parks, points of interest, schools and other public facilities throughout Mason County, while also providing links to regional trail systems.

Regional Trail Planning Policies

- Trails should lead to or between communities, parks, schools, libraries, community centers, and other specific points of interest or attractions (including Pierce County).
- Promote a regional sense of community and improved quality of life for county residents.

Identified Regional Connections

- Cascadia Marine Trail (Water Trail).

Thurston Regional Trails Plan

Thurston County borders Pierce County to the west. The 2007 Thurston Regional Trails Plan defines the county trail network and contains a set of guidelines and recommendations for all of Thurston County and its cities, towns, and communities. The plan contains several policies and goals that have a relationship with the Pierce County trail planning process.

Regional Trail Planning Policies

- Building a functional regional network of contiguous and connected north-south and east-west off-street shared-use trail corridors that will serve as the backbone of the non-motorized transportation system; and
- Ensuring that trail design, development, and programs function seamlessly across community borders and between regions.

Identified Regional Connections

- City of Dupont.

- Town of Roy.
- Yelm Prairie Line Trail.

Yakima County Trails Plan

Yakima County borders Pierce County to the east along the edge of the Mt. Rainier National Park. The Yakima County Trails plan was adopted in May of 2008 and contains goals, policies, standards, and implementation strategies for improving and expanding Yakima County's trails network, particularly for the unincorporated areas of the county.

Regional Trail Planning Policies

- Support efforts to establish a regional and statewide trail system.
- A countywide system of safe, efficient, and interconnected trails will be provided over time, including on and off-street facilities that link populated areas of the county with important travel destinations.
- The need for trails will be met through appropriate planning, design, construction, and maintenance of facilities. This includes single-use and shared use trails, roads and road shoulders, sidewalks, bike lanes and related improvements. Design will address the needs of both experienced and less experienced trail users and users of all ages and abilities.

Identified Regional Connections

- Mount Rainier National Park.
- William O. Douglas Trail.

G.Trail Permitting Process

Trails Permitting Process

The permitting process is a critical component in the successful development of a trail network. The process is designed to protect natural and cultural resources (federal, state and local regulations), ensure public safety (building codes), and provide compatible uses within existing communities (Growth Management Act, local plans, and zoning).

Depending on the setting, trail permitting can be complicated, requiring review and permitting by various agencies. Natural resources, critical areas, and endangered species are all issues that can increase the complexity of the permitting process. Trail funding can also create the need for additional permits, especially when federal funding is involved. In addition to these issues, many trail projects go through a public involvement process that can lengthen the permit review period.

Without a specific trail alignment it is difficult to determine necessary permitting requirements. As such, the following provides a general overview of planning considerations and types of review that are typically required. While not all planning considerations or types of review may be involved in the development of a particular trail, it is important to identify some of the more common. Once a trail alignment has been identified, this information can be used to consider specific site conditions.

Planning Considerations

The most common considerations to identify in the trail planning process include tribal areas, rights of way, existing uses, zoning, and critical areas.

Tribal Areas

Pierce County is home to several Indian tribes including the Muckleshoot, the Nisqually, the Steilacoom, and the Puyallup Tribes. In the Tacoma area, alignments along the Puyallup River and other areas will likely be within the Puyallup Tribe 1873 Medicine Creek Treaty Lands. Federal funding for a trail project in this area will require review, as specified under Section 106 of the Historic Preservation Act. State funding for a trail project in this area will require review, as specified under Executive Order 05-05. Both of these regulations require a cultural and historical resource assessment. In addition, many local agencies require a cultural and historical resource assessment for projects that disturb soils in these areas.

Rights-of-Way

Reaching an agreement by all effected property owners can be a lengthy process. Regardless of whether a proposed trail is on existing public right-of-way or not, it is important to include affected property owners early in the process, provide information, and discuss any issues regarding trail development and use. As such, securing the necessary rights-of-way for a trail segment may take time and may require phasing. It is common for many trail alignments to follow existing rights-of-way, including rail lines, public easements, and natural resource buffers. To avoid potential issues related to property ownership, easement status, or other property issues, it is important to research all effected properties through a title company. If property is purchased for a trail, additional research including a Phase I environmental site assessment will also be required.

Existing Uses

Trail projects can provide connections to different neighborhoods, commercial areas, parks, open spaces, commuter stations, schools, and recreation facilities. Although trails are typically compatible with existing uses, some communities may require a permit. Existing uses should not preclude trail development, although some uses create unique challenges to the planning process. This is especially common in areas that have heavy traffic, or busy intersections. Trail planning should consider local transportation plans and permits, as well as county, region, and state transportation plans and agencies. As a result, trails that intersect or follow busy streets and intersections should incorporate safety improvements within these areas, especially if the proposed trail is used as a school route.

Zoning

Public trails are typically compatible with most zoning regulations. Many local zoning codes allow trails outright along existing rights-of-way. However, private trails or trail development on private property may be limited in incompatible zoning districts. Some community planning areas in Pierce County do not allow trails in all zoning districts. The Gig Harbor Community Plan, for example, restricts or prohibits trails in several of its zoning districts.

Critical Areas

The Pierce County region has marine shorelines, streams, lakes, wetlands, steep slopes, geological hazard areas, and is home to many federally listed endangered species. Federal permits and funding will require biological assessments to determine whether proposed trail projects impact endangered species or their habitat. Pierce County and local cities will

require critical area reports, including wetland reports, landslide hazard reports, and habitat reports. In addition to the county, many local cities have either adopted or are in the process of developing open space plans in addition to park plans. Information provided in these plans will be important for making trail connections to parks and open space.

Types of Review

Trail development on or adjacent to critical areas in Pierce County requires a variety of permits. Depending on the proposed trail location or funding type, common types of review may involve endangered species, archeological resources, stormwater, and water resources.

Endangered Species

The listing of several northwest fish species under the Endangered Species Act (ESA) requires compliance with federal regulations. These regulations ensure that construction in marine waters, wetlands, lakes, and streams does not have a detrimental impact on fish and does not impact designated fish critical habitat. In addition to fish, Pierce County is home to many listed ESA species.

Archeological Resources

Archeological reviews are required at the federal, state and local levels. In November 2005, the State of Washington Executive Order 05-05 was put in place to protect the rich archeological and historical sites in the state. As part of protecting that heritage, work that requires excavation and is not subject to federal regulations requires cultural and historical assessments at the state level if state funds are used. This includes minor excavation for trails.

Stormwater

Stormwater issues create additional permitting requirements. Recent decisions by the State of Washington Pollution Control Hearings Board require “All Known Available and Reasonable Methods of Treatment (AKART)” to be used in development projects. As specified in the hearing board order, AKART is the use of low impact development techniques, including pervious pavement, rain gardens and other low impact stormwater treatments to prevent pollution.

Water Resources

If trail development occurs on a stream, stream buffer, wetland, wetland buffer or within 200 feet of an existing regulated shoreline, local critical area codes and shoreline codes will apply requiring stream, wetland and shoreline permits. A habitat assessment will be required for projects occurring on areas that are heavily forested or provide critical habitat for wildlife, especially wildlife that do not typically inhabit urban areas. Federal and state permits include review under the Clean Water Act (CWA), Hydraulic Project Approvals (HPA), and potential tribal review under the CWA and the Endangered Species Act (ESA).

Permitting

Federal permits include those administered by the Army Corps of Engineers under the CWA. These are required anytime there is work in a water of the US (considered to be most wetlands, rivers, streams, and some drainage ditches). For trail projects within waters of the US, the Army Corps of Engineers would conduct their review under Section 404 of the CWA, with the State Department of Ecology (Ecology) or the local Tribal entity providing review under the Section 401 of the Clean Water Act. ESA review is required anytime there are federal permits or funding and a potential impact to a listed endangered species, including listed fish and southern resident killer whales (Orcas). State permitting requirements will include WDFW HPA which is required for work in, over, under, or adjacent to a water of the state along with Ecology review (if no 401 review) under RCW 90.48. Trail head locations might require a conditional use permit from the local agency.

Regulatory permitting is constantly changing. New regulations are being developed for reduction of green house gas emissions but nothing has been finalized in Pierce County. Mitigation will most likely be required and commuter trails provide a potential option as mitigation. Given the current regulatory environment, challenges will be encountered for trail projects based upon the amount of time required for permit review. Many federal, state, and local agencies have very heavy workloads and permitting review can range from six to eight months. Generally review of the project funding and location should help to determine which of the following permits/approvals will be required:

- Section 404 Permit from ACE under the CWA.
- Section 401 Permit from Ecology or local Tribe under the CWA (Note: If the project does not require a 404 permit, then section 401 is not applicable).

- WDFW HPA for work over, under, adjacent to waters of the state.
- Habitat Assessment, Biological Assessment.
- Wetland review and review by ecology under RCW 90.48.
- Cultural and Historical Assessment.
- Review under the State Environmental Policy Act (SEPA).
- Review under Critical Area regulations.

In order to obtain the necessary permits, especially for wetlands, mitigation will be required. Depending on the area, several permits could be required prior to construction. Once the final alignment is selected and the environmental permitting is completed, building permits will need to be obtained.

There are always challenges to constructing trails, but trails provide many benefits. Communities can create trail systems to connect with transit stations, parks, schools, and neighborhood shopping areas. The Pierce County regional trail system can continue working toward connections to existing trails such as the Interurban Trail, the Foothills Trail, the Scott Pierson Trail, Cushman Trail, and the Chehalis Western Trail which will enhance recreation opportunities and commuting options for area residents.

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H-1: Federal, State and Local Regulations

General Regulatory Requirements			
Special areas:	Federal	State	Pierce County*
Right of Way	---	---	Permitted outright within existing right of ways.
Wetlands	Section 404 of CWA, Army Corps of Engineer permit required (there are two permitting levels within the Section 404, one is a Nationwide Permit (NWP) and the other is an individual permit. Many trails (less than 1/2 acre impact) fall into the NWP -14 category.	If reviewed by Corps under Section 404 then a Section 401 review by State Department of Ecology(or local tribe); If no Section 404 Ecology still regulates under RCW 90.48; Possibly requires Hydraulic Project Approval (HPA) from Washington State Dept of Fish and Wildlife (WDFW) (HPA applies to work adjacent to, in on over or under the	Critical Area Review under PCC - Wetland report and mitigation for impacts - PCC 18E.20 AC provides conditions where trails are allowed in wetland buffers.
Streams	Section 404 of CWA, Army Corps of Engineer permit or if stream is considered navigable Section 10 of the Rivers and Harbors Act applies if there are endangered fish in the stream a biological assessment will be needed (some wetlands are connected to streams, providing refuge for juvenile salmon and work in those will require preparing a biological assessment).	Section 401 review by State Department of Ecology (or local tribe); If no Section 404 Ecology still regulates under RCW 90.48; HPA from Washington State Dept of Fish and Wildlife.	Possible shoreline report and permit application (streams over 20 cfs); minimum stream report including Habitat Assessment and Shoreline erosion report
Other Critical Areas	---	---	Other Critical Areas within the PCC include Volcanic Hazards, Aquifer Recharge, Flood plains, Landslide Hazards

H-1: Federal, State and Local Regulations

General Regulatory Requirements			
Special areas:	Federal	State	Pierce County*
Marine Shorelines	Section 404 of CWA, Army Corps of Engineer permit or if waterward of OHWM Section 10 permit for work in navigable waterway	Section 401 review by State Department of Ecology; Hydraulic Project Approval from Washington State Dept of Fish and Wildlife	Compliance with County Shoreline Master Program, shoreline erosion hazard report and possibly a landslide hazard report depending on the site. Shorelines designated as "Natural Environments" do not allow paved trails.
Tribal Lands	Tribal entity has jurisdiction as a sovereign nation, Pierce County region tribes include: Puyallup Tribe, Nisqually Tribe, and Muckleshoot Tribe	Executive Order 05-05 must be complied with for all public works projects that receive state funding	Pierce County requires a cultural site assessment for all their projects involving excavation.
Federal Funding	Compliance with National Environmental Policy Act (NEPA)	---	NEPA Environmental Assessment or Environmental Impact Statements can be adopted for SEPA.
Projects that are not exempt from environmental review	---	State Environmental Policy Act - trail maintenance is typically exempt from SEPA.	SEPA determination is made by the local agency, in this case Pierce County Planning, if there is federal funding and the project is a NEPA Environmental Assessment or Environmental Impact Statement, the NEPA can be adopted for SEPA.

*All Pierce County Projects require compliance with development regulations.

At a minimum an abbreviated site plan will be required for all trail projects and Low Impact Development techniques for treating storm water should be included in all

H-2: Community Planning Areas

Pierce County Zoning Designations	
Pierce County Code designates linear trails in the Civic Use Category as recreation non-profit; the use is considered a Level 4 Use	
Pierce County Outside Community Planning Areas	
Allowed in all Rural residential classifications	
Allowed in all Rural Centers and Resource Lands	
Allowed in all Urban Centers and Employment Centers	
Community Planning Areas:	
Alderton- McMillin	NOT allowed in the following districts: Agricultural Resource Lands; Rural Farm
Frederickson	Allowed in all districts
Gig Harbor Peninsula	NOT allowed in the following districts: Rural Neighborhood Center Requires Conditional Use permit in: Essential Public Facility Airport North; Rural 10; Rural 5; and Rural Sensitive Resource
Graham	Allowed in all districts
Key Peninsula	Allowed in all districts
Parkland-Spanaway-Midland	Allowed in all districts
South Hill	Allowed in all districts
MidCounty	Allowed in all districts

The permitting process can be very complicated and involved. Each project should be considered on a case by case basis, the following two examples should help illustrate why.

Example 1
<p>A trail constructed across an existing stream (non-navigable), with in water work, in the Graham Community Planning Area could require the following permits/approvals:</p> <ul style="list-style-type: none"> • Army Corps of Engineers - Section 404 NWP 14, if there are endangered fish in the stream prepare a biological assessment • Ecology either a Section 401 permit (if Ecology issues the decision after the Corps reviews and issues their decision) or an Administrative Order under RCW 90.48 • WDFW - Hydraulic Project Approval (HPA) for work in, on, over, or adjacent to a water of the state please note WDFW will not review until the SEPA is issued. • SEPA - issued by Pierce County • Pierce County Planning will require a habitat assessment report, a shoreline erosion hazard report, and cultural assessment.

Example 2
<p>A trail constructed across an existing stream (non navigable) with all work on the upland (no in water work) and in the Graham Community Planning Area could require the following permits/approvals:</p> <ul style="list-style-type: none"> • WDFW HPA for work in, on, over, or adjacent to a water of the state please note WDFW will not review until the SEPA is issued • SEPA - issued by Pierce County • Pierce County Planning will require a habitat assessment report, a shoreline erosion hazard report, and cultural assessment.

G-3: Pierce County Special Areas

Federal	State	Local
Floodplains		
May require creating compensatory flood plain storage	New state regulations may include the floodplain adjacent to rivers as part of the	SEPA, regulated by the Critical Area Regulations
Wetlands		
If water of the US and work is in-water Section 404 permit; Section 106 and Biological Assessment	If Section 404 then Section 401 if not, RCW 90.48; MAY require HPA from WDFW	SEPA; Wetland Report and Fish and Wildlife Habitat Assessment; Cultural Assessment
Wetlands connected to fish bearing streams		
If navigable Section 10 and possibly Section 404, non navigable Section 404, Biological Assessment; Section 106	If Section 404 then Section 401 if not, RCW 90.48; HPA from WDFW; if state funded EO 05-05 review	SEPA; Cultural Assessment; Wetland Report, Fish and Wildlife Habitat Assessment, possibly Shoreline Report
Lakes		
If navigable Section 10 and possibly Section 404, non navigable Section 404, Biological Assessment; Section 106	If Section 404 then Section 401 if not, RCW 90.48; HPA from WDFW; if state funded EO 05-05 review	SEPA; Cultural Assessment; Wetland Report, Fish and Wildlife Habitat Assessment, possibly Shoreline Report
Nonfish Bearing Streams		
If navigable Section 10 and possibly Section 404, non navigable Section 404, Section 106	If Section 404 then Section 401 if not, RCW 90.48; Possibly an HPA from WDFW; if state funded EO 05-05 review	SEPA; Cultural Assessment; Wetland Report, Fish and Wildlife Habitat Assessment, possibly Shoreline Report, possibly shoreline erosion hazard report and landslide hazard report
Fish Bearing Streams		
If navigable Section 10 and possibly Section 404, non navigable Section 404, Biological Assessment; Section 106	Section 401 from Ecology, HPA from WDFW; if state funded EO 05-05 review	SEPA; Cultural Assessment; Wetland Report, Fish and Wildlife Habitat Assessment, possibly Shoreline Report, possibly shoreline erosion hazard report and landslide hazard report.
Marine Shorelines		
If navigable Section 10 and possibly Section 404, non navigable Section 404, Biological Assessment; Section 106	Section 401 from Ecology, HPA from WDFW; if state funded EO 05-05 review	SEPA; Cultural Assessment; Fish and Wildlife Habitat Assessment; Shoreline Report, possibly shoreline erosion hazard report and landslide hazard report
Tribal Lands		
All federal permits are applicable (e.g. if in water work an Army Corps permit is required).	Sovereign Nation, not regulated by the State	Sovereign Nation, not regulated by County
*All Pierce County Projects must comply with Pierce County Stormwater development regulations including work in special areas.		
At a minimum an abbreviated engineered site plan will be required for all trail projects and Low Impact Development techniques for treating storm water should be incorporated into trail work.		

G-3: Pierce County Special Areas

Project Cost:	
1% for Arts	Public projects costing over \$100,000 require a contribution of 1% for arts
Grant Funding:	
Federal Grants (including NPS grants and some RCO Grants)	Require review under NEPA, Section 106 and Biological Assessment for ESA listed species, ADA compliance.
State Grants (including some RCO Grants)	Require review under SEPA, Executive Order 05-05, ADA compliance.
Regulatory Definitions:	
Biological Assessment/Evaluation (BA/BE):	A document that evaluates the project activities and how those activities will effect federally listed endangered species.
Cultural Assessment:	Pierce County any area requiring excavation needs to provide assessment for cultural and historical resources
Executive Order 05-05:	If NEPA and Section 106 are not applicable, the State under Executive Order 05-05 requires review to ensure no tribal cultural or archeological sites are effected.
Fish and Wildlife Habitat Assessment:	Review of areas that support various species including ESA listed species, elk habitat, oak prairies, etc.
Hydraulic Project Approval (HPA)	Washington State Fish and Wildlife issues an HPA for work in waters of the state under RCW 77.55.
Landslide Erosion Hazard:	Required by Pierce County for areas prone to Landslides, Pierce County Atlas provides information.
National Environmental Policy Act (NEPA):	If a project has federal funding a NEPA exclusion, Environmental Assessment or Environmental Impact Statement is required.
RCW 90.48:	An Administrative Order issued by Ecology to allow work in wetlands when there is no Section 404/401 requirement.
Section 10 Rivers and Harbors Act:	Required for work in Navigable Waterways as determined by the Army Corps of Engineers, Application is by submitting a Joint Aquatics Resource Permit Application (JARPA).
Section 106:	If federal funding or a federal permit, review under Section 106 of the historic preservation act applies to ensure protection of tribal, archeological and historical resources.
Section 401 Clean Water Act:	If the project requires Army Corps review under Section 404 of the CWA, it may also require review and approval under Section 401, Ecology will review or the tribe if the work is on tribal land/waters. The Section 401 CWA review (if needed) is completed after the Section 404 CWA approval.
Section 404 Clean Water Act (CWA):	Required for all work in waters of the US, including wetlands. Administered by the Army Corps of Engineers, application is by submitting a Joint Aquatics Resource Permit Application, if work is done where there are endangered fish a Biological Assessment/evaluation will be needed.
State Environmental Policy Act (SEPA):	State Environmental Policy Act required for most trails unless the project is repair and maintenance or on existing right of way.
Shoreline Erosion Hazard:	Required by Pierce County for shoreline areas.
Shoreline Report SMA/SMP:	Shoreline Master Program, work within 200 feet of shorelines requires local review under the Shoreline Master Program, including trails.
Water of the US:	Includes wetlands that are connected to streams and SOME isolated wetlands. Does not include Prior Converted Croplands (PCC).
Wetland Report:	Required by Pierce County for work in or around wetlands, report will include mitigation if any wetlands are affected by the project.

H. Trail Design Guidelines

Trail Design Guidelines

The regional trail system will run through several unique environments and attract a variety of different users. This appendix presents the design guidelines for regional trails (multi-use, urban and unpaved), regional trailheads (urban and equestrian), a street crossing (major arterial) and a variety of trail amenities. These guidelines are intended to serve as a menu—or palate—for trail design and are based on the most recent versions of widely accepted regulatory guidelines that are amended and supplemented throughout this section¹. These guidelines may be amended from time to time by published changes found on the Pierce County website. Construction of the trails envisioned in this plan are based on the specifications and provisions described in the call for bids for any given trail project. The specifics of landscaping and vegetation are addressed in Title 18J, Development Regulations – Design Standards and Guidelines².

Pierce County’s Parks and Recreation Department recognizes that trail development must comply with county, state and federal regulations that may result in conflicts with the guidelines presented in this chapter. In such a case, the final design of a trail project must comply with the regulatory requirements. In addition, some trail sections that are currently owned by Pierce County may not meet these design guidelines. Therefore, Pierce County trail sections constructed prior to the adoption of this plan will be retro-fitted to meet these new guidelines only when it is practical and on a case-by-case basis to do so.

Regional Trail Cross-Sections

Trail cross-sections provide graphic illustrations of how each type of trail might be designed to accommodate a variety of trail users. The cross-sections provide specifications related to trail width, shoulders, vertical clearance, and relation to other trail amenities.

Multi-use Trail

The Foothills Trail is a popular example of a multi-use trail. Multi-use trails are generally suitable for most trail corridors; however the width may not fit within some corridors such as areas adjacent to critical areas that are environmentally sensitive lands. The multi-use trail should provide for a

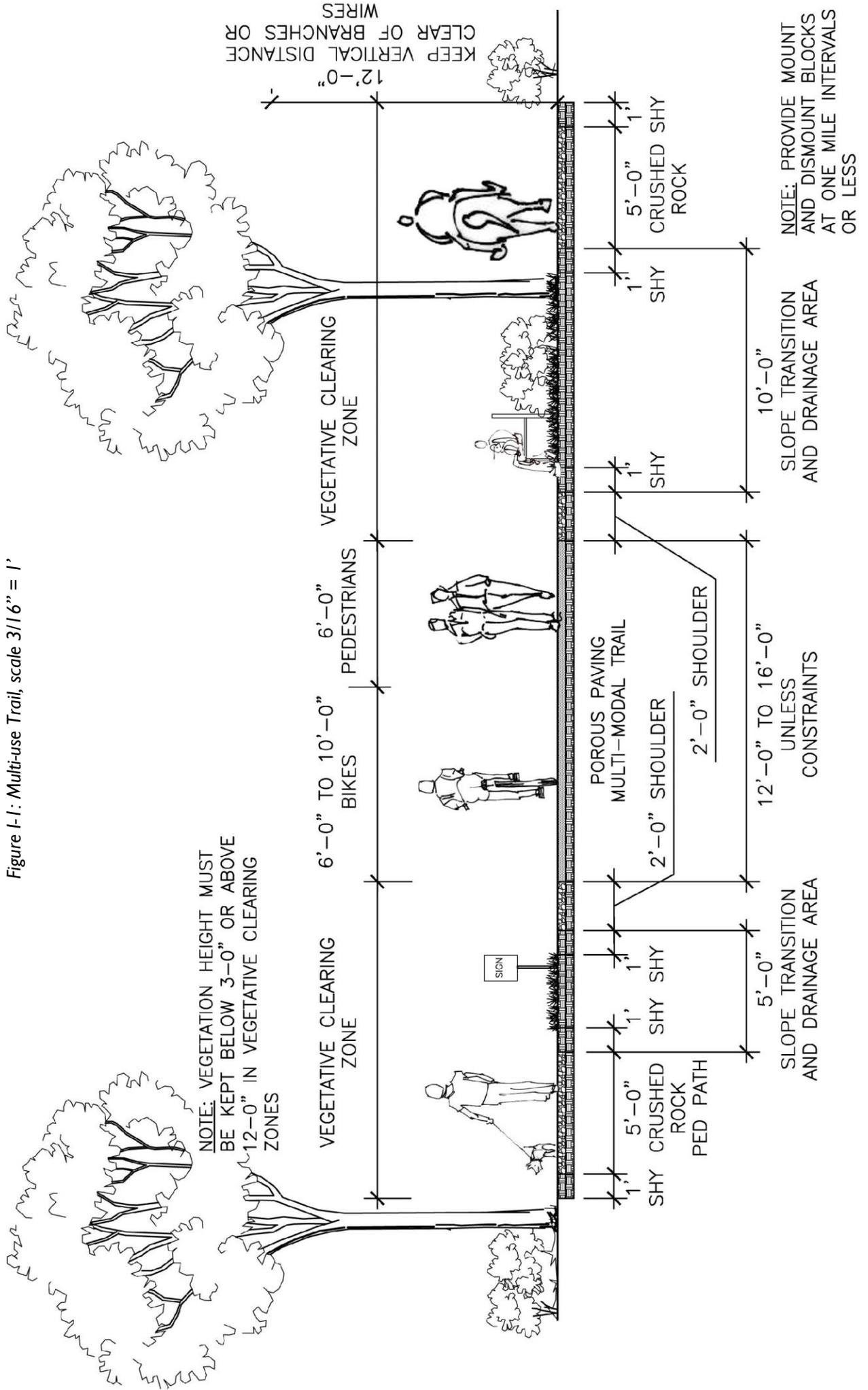
¹ Guide for the Development of Bicycle Facilities; Pedestrian Facilities Guidebook, Toolkit 4; Architectural Barriers Act (ABA) Accessibility Guidelines for Outdoor Developed Areas: Proposed Rule; Traffic Controls for Bicycle Facilities.

² Section 18J.15.030

range of trail users with a wide surface and separated or extended shoulders for pedestrians and equestrians. Figure I-1 on the following page illustrates a trail design that would accommodate the widest variety of users. This trail design is intended for trails outside of urban growth areas.

- Multi-use trail surface should be no less than 12' wide with 2 x 2' shoulders, 2 x 1' shy distance next to the shoulders and include additional area needed for slope and fill maintenance;
- Minimum clearance is 12' in height to the first tree-limb, guy-wire or other object;
- When hard-surfacing is used the trail should be constructed of porous paving with soft surface unpaved shoulders; in some instances porous paving may not be suitable and the use of impervious surfacing should be considered;
- Signs, mileage markers, equestrian mount/demount blocks, fence, benches and other placed features must be located outside of the shoulders;
- Trails that include equestrians users should provide at least one shoulder that is no less than 5' in width with mount/demount blocks at no less than one mile apart;
- Unless otherwise required by regulation, shoulders should allow for machine maintenance of the vegetation;
- Placement of benches, trash receptacles, drinking fountains and other trail amenities should allow for machine maintenance of the vegetation with at least 8' of clearance around any feature and not interfere with equestrian users when applicable; and
- Limited sight-distance at curves should be striped for two-way travel lanes.

Figure I-1: Multi-use Trail, scale 3/16" = 1'



Urban Trail

The urban trail (Figure I-2) is a slightly narrower version of the multi-modal trail design and is designed to run parallel to streets in urban areas. The design is suitable for most trail corridor types and is most common within street rights-of-way. These trails, as with multi-use trails, should be designed to accommodate a range of users. Urban trails are also suitable for sub-regional and connector trails.

- Urban trail surface should be no less than 10' wide with 2 x 2' shoulders, 2 x 1' shy distance next to the shoulders and include additional area needed for slope and fill maintenance;
- Minimum clearance is 12' in height to the first tree-limb, guy-wire or other object;
- When hard-surfacing is used the trail should be constructed of porous or impervious paving with soft surface unpaved shoulders;
- Limited sight-distance at curves should be striped for two-way travel lanes;
- A 1' safety clearance and 5' landscaping buffer is preferable;
- Unless otherwise required by regulation, shoulders should allow for machine maintenance of the vegetation; and
- Placement of benches, trash receptacles, drinking fountains and other trail amenities should allow for machine maintenance of the vegetation with at least 8' of clearance around any feature.

Unpaved Trail

The unpaved trail (Figure I-3) is suitable for segments of the regional system that are located in rural areas, within parks or are located in critical areas. Unpaved trails are suitable for most trail corridor types but because the trail is unpaved, this trail is not preferable for certain users that enjoy or require a hard smoother surface, such as skaters and some cyclists.

- Unpaved trail surface should be no less than 10' wide with 2 x 1' shoulders, 2 x 1' shy distance next to the shoulders and include additional area needed for slope and fill maintenance;
- Minimum clearance is 12' in height to the first tree-limb, guy-wire or other object;
- Trail surface should be constructed of crushed gravel or similar material;
- Unless otherwise required by regulation, shoulders should allow for machine maintenance of the vegetation; and

- Placement of benches and other trail amenities should allow for machine maintenance of the vegetation with at least 8' of clearance around any feature and not interfere with equestrian users when applicable.

Figure I-2: Urban Trail, scale 3/16" = 1'

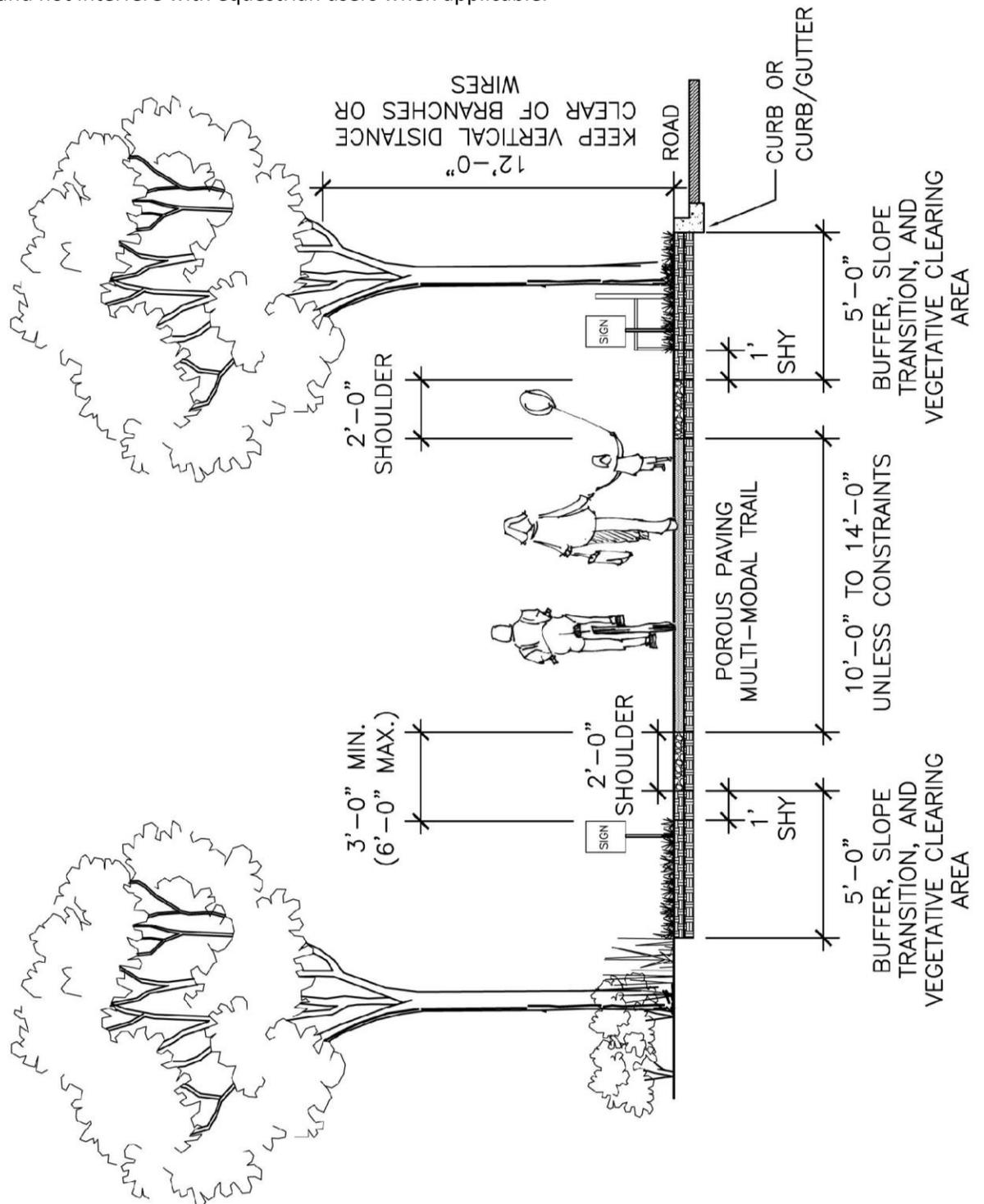
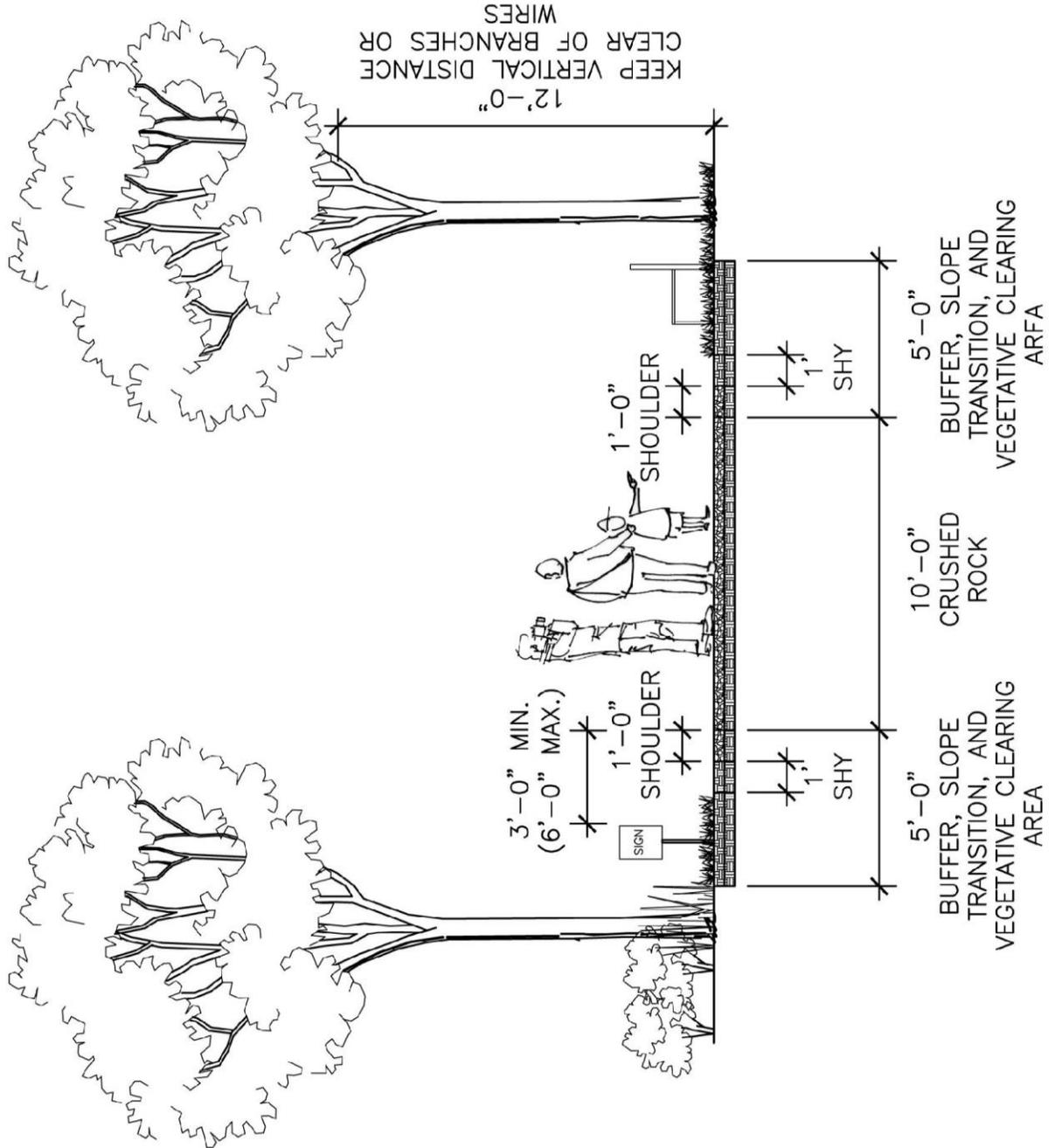


Figure I-3: Unpaved Trail, scale 3/16" = 1'



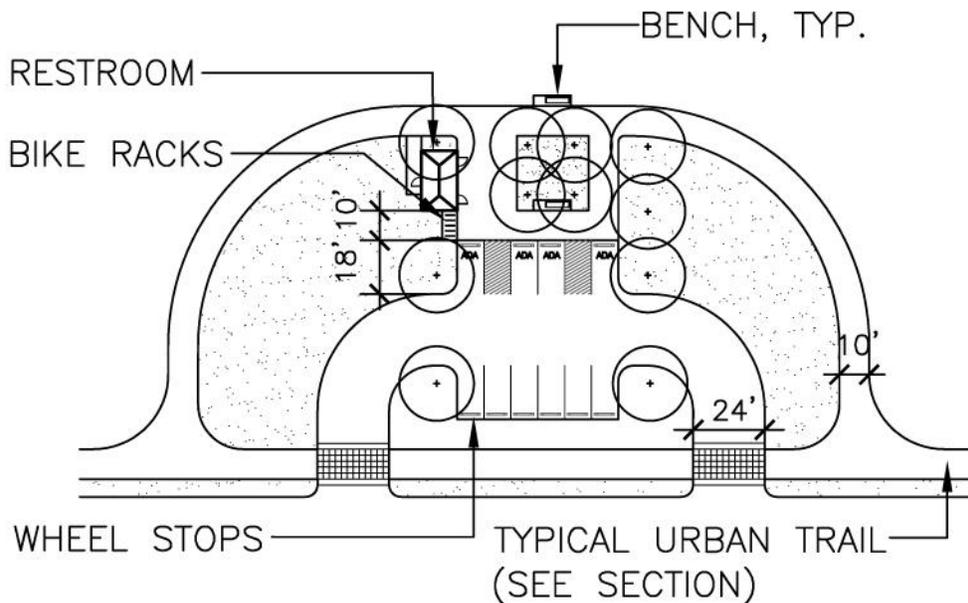
Trailheads

There are two trailhead designs provided in this section: the urban and equestrian trailheads. The majority of trail users will access the regional trail at one of many formal trailheads. Trailheads let users know they have entered or exited the trail system with clearly marked signage and other visual cues such as information kiosks. These facilities provide users with places for vehicle or bicycle parking, may provide staging areas for equestrians, and can provide other amenities such as seating and restrooms. Law enforcement, emergency vehicles, and maintenance crews also require sufficient trail openings at trailheads designed to allow for occasional vehicle access.

Urban Trailhead

The urban trailhead (Figure I-4) accommodates trail users locally and throughout the region. While some users will live close enough to access the trail on foot or by bike, the trail system's regional draw will require sufficient parking for users traveling by car. The urban trailhead design allows for parking where the regional trail is adjacent to a street. These trailheads should be built at easy to find locations that offer safe and convenient access, near major roadways, transit stops, and services such as shops selling food and drinks.

Figure I-4: Urban Trailhead, scale 3/16" = 1'



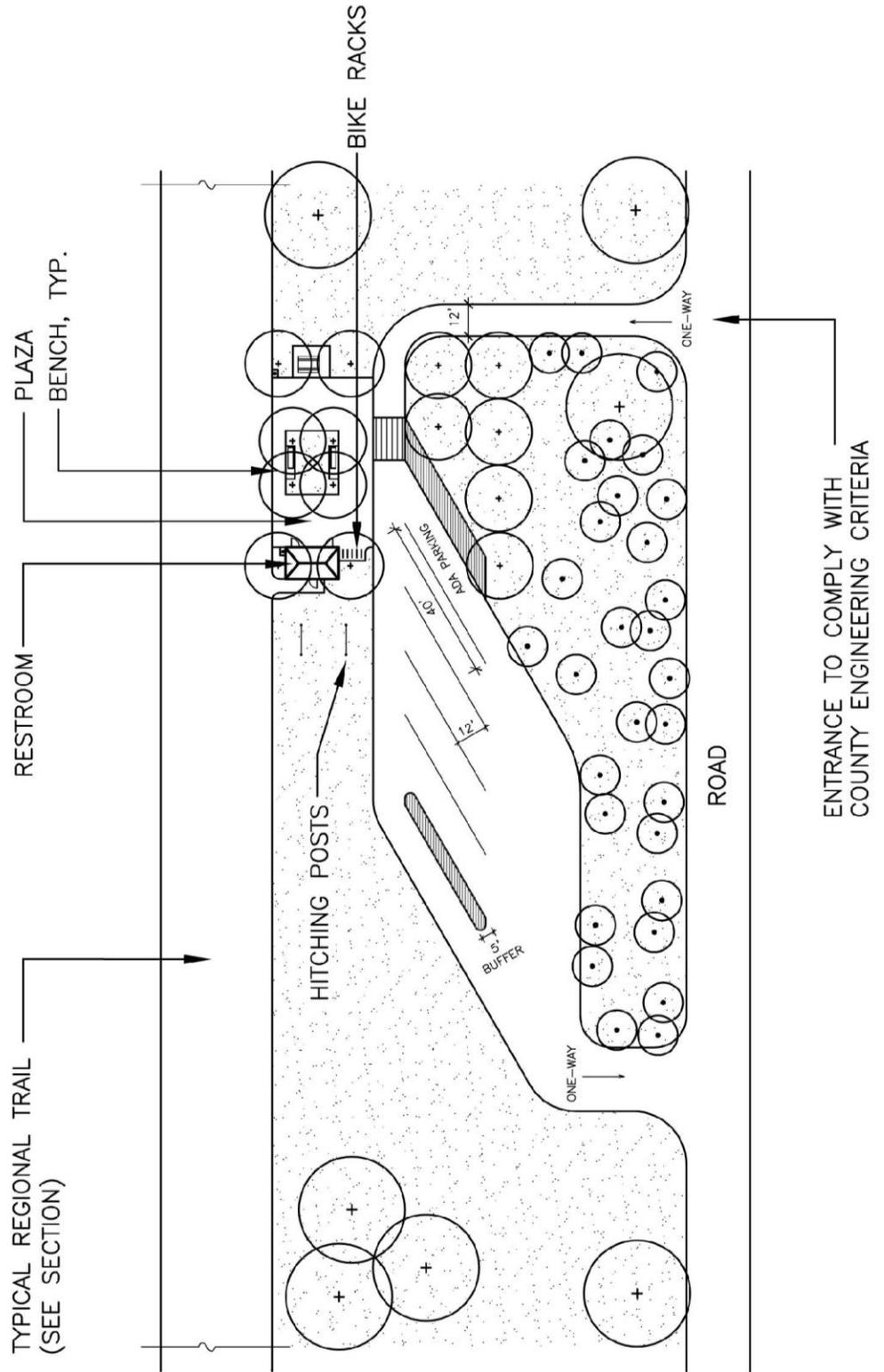
The full service trailhead features ample parking, with ADA designated spaces, and a two-way, circular drive aisle. Two trail spurs provide an option for users to access the trailhead plaza and for safe access to the parking area. The configuration also allows through access to continue on the regional trail. The full service trailhead plaza features a restroom and landscaped seating area, as well as a bike rack for secure parking.

Equestrian Trailhead

The equestrian trailhead (Figure I-5 on the following page) is a full service trailhead design. The design allows parking where the regional trail is separated from the street. This trailhead is more suitable for locations outside urban areas that will receive more use from equestrians. These trailheads should be placed near smaller rural communities, or near sections of trail that offer a separated equestrian trail or wide shoulders.

Unique to the equestrian trailhead parking area are the 40' long parking isles to accommodate horse trailers. The spaces can be striped to provide parking for standard length vehicles as well. The design also features ADA access and a one-way drive isle that accommodates trailers. A crosswalk from the parking area leads users to the trailhead plaza which includes a restroom and seating area. Bicycle racks are also sited in this area creating a secure space to lock bikes. The full service trailhead can also include hitching posts, providing a staging area for equestrians.

Figure I-5: Equestrian Trailhead, scale 3/16" = 1'



Regional Trail Property, Easements And Right-Of-Way

Identifying possible trail alignments and trail design are just two of many steps that must be taken to develop a functional trail. After mapping the general location of the trail, the next step is to identify property ownership along the trail alignment. Property acquisition for trail development and maintenance is best explored on a case-by-case basis. However, where state or federal funds might be involved in any portion of the trail project, past or present, proper right-of-way acquisition procedures outlined by Washington State Department of Transportation (WSDOT) shall be followed³.

Road Crossing

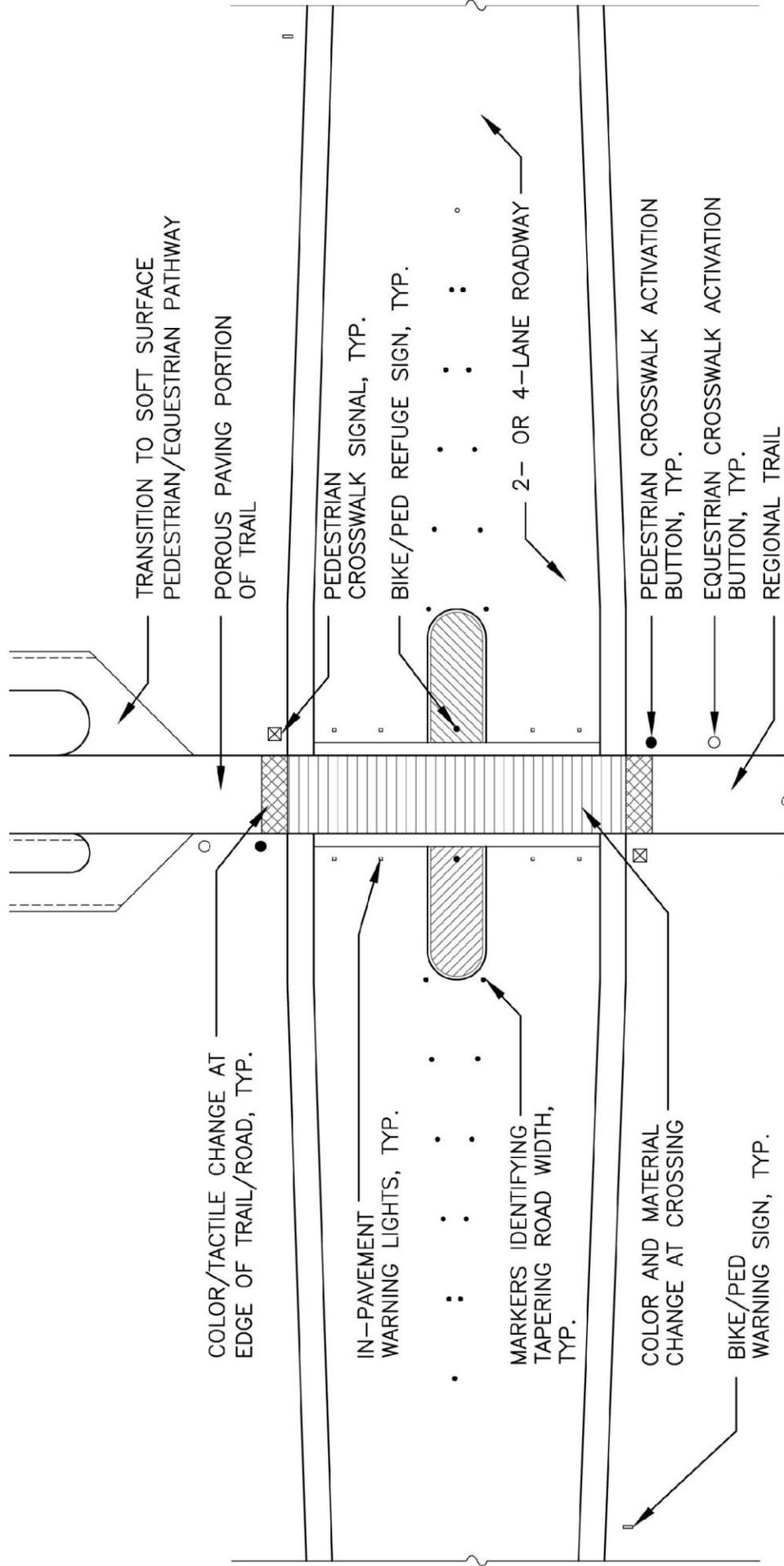
Regional trails will intersect in some places with busy streets. Proper design will allow for safe street crossings for trail users. Crossing design treatments can also give drivers a visual warning to slow and stop for trail users. Figure I-6 is a standard design detail for street crossings that warrant signalization.

Street Crossing (Major Arterial)

The design for crossing street that require signalization should provide a visual cue to slow or stop for both trail users and drivers. The intersection location should be based on AASHTO and WSDOT requirements for sight and stopping distance and other applicable design requirements. As the trail reaches the street the trail material should change or be marked to denote the street crossing. The design includes a pedestrian crosswalk signal that provides light controlled access to safely cross the street. The crossing features in-pavement warning lights and contrasting colors and material. The center of the street features a pedestrian refuge, while also narrowing the street to slow traffic. Streets that do not warrant signals should have similar crossing treatments without the electrical requirements.

³ “Local Agency Guidelines” WSDOT, Highways and Local Programs, April 2009, Chapter 25 “Right-of-Way Procedures”.

Figure I-6: Road Crossing (Major Arterial), scale 1/2" = 1'



Private Crossing (Driveways and Private Roads)

Unlike public roads and intersections, a private driveway or private road that crosses the trail presents a number of different issues. Because a private trail crossing can create a danger to trail users as well as drivers, these crossings should be avoided. However, when a private crossing can not be avoided the following need to be explored:

- Both trail users and vehicles must be warned of the potential danger by control signs that are conspicuously posted and maintained⁴;
- Trail pavement at the crossing must withstand existing and new vehicle traffic that will be crossing the trail by placing limits to the weight of the vehicles that will cross or through engineering the crossing to accommodate the expected loads; and
- The proposed crossing must not create a violation of the County's property interest in the trail, or violate any existing easements.

Trail Amenities

Trail amenities encourage trail use by providing an experience that is safe, comfortable, and convenient. Amenities should be accessible to all users and placed in safe, visible, and convenient locations and be vandal resistant. There are a variety of products and designs, made with different materials, all at different price ranges. However, it is important to balance the up-front costs of trail amenities with long-term maintenance needs. That is, some products or materials may be more expensive than others, but will last longer, and require less maintenance saving money in the long-run. Trail amenities should also have a consistent design throughout individual trail corridors. Sign design, lighting, and even benches should all have similar colors, materials, and overall design theme to evoke a nearby or notable local element such as Puget Sound and Mt. Rainier. This section provides a description of several trail amenities, including specific design guidelines and examples

⁴ RCW 4.24.210(4)

Benches

Benches provide people of all ages and abilities a place to sit and rest along the trail. When designing or purchasing a bench, consider user comfort, simplicity of form and detail, ease of maintenance, durability of finish, and resistance to vandalism. Above all else, benches should accommodate all users and should include back rests and arms. Typically, a bench's seat is located between 16" and 18" above the ground, with handrails at the end between 6" and 12" above the seat. The depth of the seat ranges from 18" to 20". Usually a width of 24" to 30" is allotted per person. Benches and other furniture should be placed away from pedestrian and bicycle circulation paths, at least 3' from the trail edge, to allow adequate room for people's outstretched legs. There must be a clear level space where a person using a wheelchair can rest adjacent to seated people. This area must be at least 30" by 48" and should be located adjacent to the benches. Benches must be positioned on an accessible surface with an accessible walk to the seating area.



Existing bench example



Accessible bench.



*Metal vertical slats bench
Source: Barco Products*

Bollards

Bollards are short, vertical posts that are used to obstruct, control and/or direct vehicle traffic from trail traffic. Bollards can be located at trailheads to limit public vehicle traffic, and can be designed to be removable if needed. Bollards should only be used if operational problems demand them; for instance, if there is a need to indicate that a particular part of the trail is open only to non-motorized users. Bollards can be internally illuminated and should be well marked and visible during day and night. Where it is considered safe to do so, only one centrally located bollard that can be removed should be used. Alternatively a split entry way for the last 10' to 30' before the intersection into two 5' sections, approximately 5' apart can be used with low landscaping separating the pathways⁵.



Removable bollard Source: TrafficGuard™



Lighted bollard (solar powered)
Source: Buy Green Energy



Split entry way Springwater Corridor,
Oregon, Source: GoogleEarth™

⁵ Chapter 4: Bikeway and Walkway Planning and Design Guidelines, FHWA.

Tables

Tables should be provided at critical points along the pathways, especially at trailheads. The table should be made of durable materials, such as vinyl coated, expanded metal or concrete which require minimal maintenance. They should be secured to a paved, accessible surface so they are universally accessible. Tables design can be a traditional rectangle to slightly octagonal. The height of the bench should be about 18" to 20" high with the table top at 30" high. The paved surface below the table should not have a slope greater than 2% in any direction and have an accessible path to the trail.



Existing table example



*46" ADA accessible octagonal table
Source: Wabash Valley*



*ADA accessible pedestal table
Source: Wabash Valley*

Bike Racks

Bicycle racks allow recreational users to safely park their bikes if they wish to stop along the way or have arrived at a destination. Three criteria should be considered when choosing bike racks for a multi-use trail: location, type of rack, and bike dimensions. Bike racks should be located at trailheads, parking areas, commercial uses and as close as possible to destinations without interfering with traffic flow; this includes the space needed for a locked bicycle. The stationary u-shaped rack and post rack are the most common and the most affordable option. These devices allow cyclists to lock both the wheels and the frame as well as move bicycles into and out of the racks with minimal effort and damage. Racks also prevent users from locking to undesirable locations such as light poles or benches. The location of a rack should be well lit and visible to prevent theft, and be protected from the elements with a roof if possible.



Existing 'U-shaped' bike rack



*Ribbon bike rack
Source: Barco Products*



*Post-style bike rack
Source: Barco Products*

Fencing

Fencing is used to protect users from potential hazards such as steep slopes or restrict access to and from the trail. The style of fence should reflect the character of the site in addition to functioning as a barrier. Coated, black or forest green chain-link is less visually impacting, while wood gives the impression of a more natural setting. Often, fencing can be as low as 4' and still be effective while being less visually obtrusive. Materials should be chosen for their durability as well as design. A wooden fence will require more maintenance than a metal or composite material. Poorly maintained fencing promotes a negative image and should be avoided. Landscaping should be considered to soften the appearance of fencing at trailheads and along trails.



Existing fencing



Black coated chain-link fencing
Source: Precision Vinyl System



Green coated chain-link fencing

Drinking Fountains

Drinking fountains provide water for people and pets. Fountains should be installed near restrooms to get the most out of utility access. The design of drinking fountains should incorporate the needs of all potential users. Spigot heights should be 42" and 36" above the ground for ADA access. To accommodate all needs, provide both standard and accessible-height spigots and install steps to the side of the standard spout to accommodate children. An additional spigot at the base allows people to fill water bottles and basins for uses other than drinking. As with any outdoor public amenity, durability is important. The best materials are treated steel and precast concrete. Fountains can also be integrated with buildings to help with winterization.



Existing water fountain



Accessible drinking fountain



*Multi-spigot drinking fountain
with pet fountain*

Ramps & Handrails

An accessible trail gradient should not exceed 5%. If it does, it will be necessary to provide a ramp to accommodate all users. Although Uniform Federal Accessibility Standards requires a maximum ramp grade of 8%, a 6% maximum is strongly recommended. Ramps should have a level landing for every 30" of vertical rise, and must have a hard, slip-resistant surface. Design should include a minimum width of 44" with 32" high hand railings on all ramps. Edges should be protected with 6" tall curbs.



Existing ramp along trail



*Ramp and handrail
Source: City of Manhattan, KS*



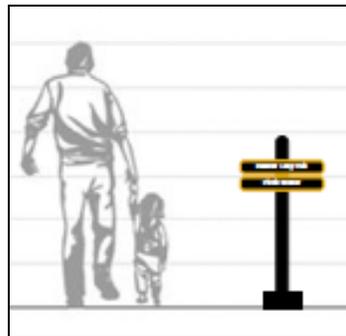
*Boardwalk ramp Source:
Alaska Travel Gram*

Directional Signage

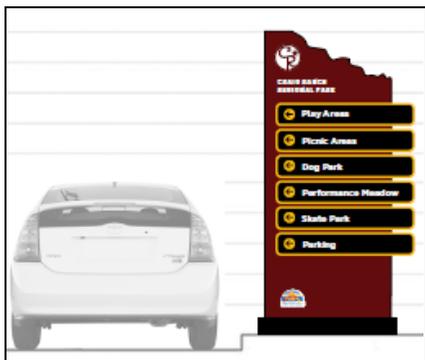
Directional and way-finding signs help users find their way to trailheads, destinations and trail amenities. Signs should provide important safety and location information including intersection warnings, trail and user restrictions and other right-of-way information, mileage and proximity to other destinations along the trail. These signs should have a consistent design theme as they will be placed throughout the trail system. The design should also be chosen based on long term maintenance needs, and have a design theme consistent with other trail amenities. Sign text should be easy to read with contrasting colors and universal symbols to indicate the direction of important amenities. When choosing materials and design, graffiti removal and vandalism control should be a key consideration. The location for directional signs should be based on an analysis of circulation routes and decision points, or trail intersections and turnouts. Sign installation should meet ADA design guidelines including a 42" minimum space between other protruding objects. Signage located at crossings with motorized roadways should comply with AASHTO and MUTCD guidelines.



Existing Adam Tallman Trail sign.



Pedestrian directional signage



Vehicle directional signage

Curb Stops

Trailhead and parking areas should have minimum development, yet some control for vehicular roads and parking. Where possible for a more sustainable design, delineation of these edges and parking separation should be accomplished to allow water to drain into natural water quality systems and not storm pipes systems. To assist with this design concept, curb stops can be used to control vehicular movement yet allow water to surface drain through the area. The material for the curb stops are premade units of recycled rubber/plastic or concrete and can be colored to add to their visibility. The curb stops are usually secured to the pavement with rods and adhesives.



Open curb stop



Existing curb stop



Curb stop

Informational Signage

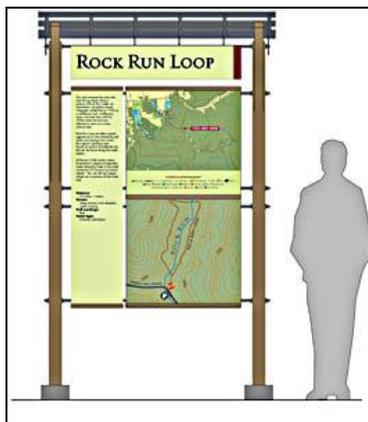
Informational signage can provide users with objective information about trails, such as trail symbols, trail length, trail direction, GPS coordinates, trail rules, trail surface type and accessibility. Information about trail conditions can help users determine whether the trail meets their own needs and abilities. In cases where more extensive trail information is provided such as maps, the history of the area, or environmental information, a profile of the trail's grade and surface should also be included so that users can identify accessible trail segments. The design of signage should be chosen based on long term maintenance needs, and have a design theme consistent with other trail amenities and signs. When choosing materials and design, graffiti removal and vandalism control should be a key consideration. Like directional signs, informational signage must meet the most current ADA design guidelines including a 42" minimum space between other protruding objects.



Existing informational signage



Pedestrian informational signage



Example of informational trailhead

kiosk

Restrooms

Restroom design and amenities vary depending on local ordinance standards and accessibility codes. The number of stalls required will also vary depending on the predicted number of trail users. These and other requirements should be considered during the early stages of design. Full-service restrooms that include running water and flushing toilets must be located near existing utilities. If existing utilities are inconveniently located, restroom design should include portable toilets with holding, septic or composting tanks. Standard toilet facilities for a single stall require a minimum of 3' by 9 ½' with a sink and 3' by 8' without a sink. Wheelchair-accessible single-stall toilets require a minimum of 5' by 10' with a sink and 5' by 8' without a sink.



Existing restroom



Public restroom

Source: Natchez Trace Parkway



*Public restroom
Source: Lake Forest, CA*

Trash/Recycling Receptacles

Although the County’s preferred policy is “pack it in and pack it out” with regards to trash, providing trash and recycling receptacles near other trail amenities such as benches, restrooms, water fountains, and bike racks, helps keep the trail clean and discourages littering. Interpretive signage should encourage the use of trash and recycling bins. Trash cans require a 30” to 48” clear space, with ADA accessible lids and an opening height of 15” to 36”. Lids must be hinged, and tamper resistant. Removable tops should be lockable.



Existing trash receptacle



*Garbage & Recycling
Source: MegaBin™*

APPENDIX I: TRAIL DESIGN GUIDELINES



Solar Trash Compactor Source: BigBelly

APPENDIX I: TRAIL DESIGN GUIDELINES

Lighting

Lights provide visibility at night and safety for trail users. Lights should be installed at trailheads and major road crossings or activity areas. The design and material of lighting should be consistent with the design of other site amenities, and be scaled for pedestrian users. Lighting levels should comply with local ordinances, and should have cut-offs to shield light from adjacent properties. Solar-powered lighting is a good option that is ultimately less expensive to operate. As with other site amenities, lighting should be tamper resistant and be made to withstand vandalism.



Existing lamp at Foothills Trail



*Pedestrian scale LED Lamp
Source: Stresscrete Group*



*Solar pedestrian scale light
Source: Sol Systems*

Pin-pile Boardwalk and Bridge

In some cases trails may have to go through sensitive environmental areas. At these sites boardwalks or bridges should be used to minimize or eliminate any environmental impacts which also reduce or eliminate permitting and mitigation requirements. There are a few foundation systems that can accomplish this goal. The primary one used is called a “pin pile” foundation, which is a local county product and adds to a project’s sustainability goals. To minimize the impact of such systems a surface hub is secured to the ground through the use of several pipe piles that are hammered into the ground without any excavation or disturbance of the surface soil. The top of the hub becomes the base to attach structural posts and then the rest of the structural membrane is assembled to create the boardwalk or bridge. After the structure has been built a sustainable decking material, kick rail and railing as necessary can be added to complete the structure. Railings are needed if the drop off at the edge of the deck is over 30” to the surface below. The railing should be a barrier style with no openings greater than 4” in diameter and a minimum height of 42”.



Existing bridge

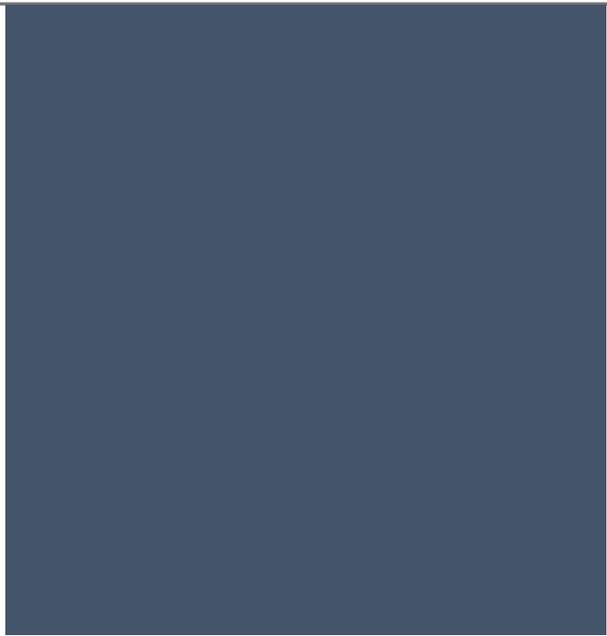


Pin-pile boardwalk



Tualatin Greenway Pin-pile boardwalk

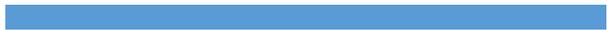
I. Public Involvement



Pierce County 2014 PROS Plan Update

Telephone Survey

Report on Findings



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1 Key Findings

Finding 1	Pierce County Parks is well known, and well rated both in terms of favorability and job performance.
Finding 2	At least two thirds think that all but one of the services Pierce County Parks offers is important. When asked about goals for the future, environmentally related items were ranked as the most important, followed by widespread access to parks and trails.
Finding 3	Performance on these same times is good, with the vast majority of items getting a majority of A or B ratings on an A-F scale.
Finding 5	Large swaths of residents regularly use each of Pierce County parks facilities at least occasionally.
Finding 6	<p>A performance-importance gap analysis shows that Pierce County Parks can improve performance on a variety of items for different audiences.</p> <p>For residents overall, Pierce County Parks can improve on Open Space, Regional Trails, and Waterfront Facilities.</p> <p>For high frequency users, Pierce County Parks can improve on Active Recreation Facilities, Regional Trails, and Facilities for League and Sports Teams.</p>

2 Project Overview

To provide Pierce County Parks and Recreation with opinion research on parks performance, perceptions on how important various services offered are, and park usage.

2.2 Approach

A computer assisted-telephone interviews (CATI) telephone survey was used to contact residents in Pierce County. Interviews were divided between incorporated (150) and unincorporated (250) Pierce County for a total margin of error calculated on 283 usable interviews of ± 5.8 points. The survey was conducted June 9th – 12th, 2013 by trained, professional interviewers from a central, monitored location.

3 Summary of Methodology

This survey was conducted via telephone in Pierce County. Interviews were divided between incorporated (150) and unincorporated (250) Pierce County. For the Countywide results, the total margin of error is calculated at 283 usable interviews for a +/- 5.8 point margin of error. The data was checked against demographics in the area. Minor weighting adjustments were made to ensure the results closely match these demographics.

The survey was conducted June 9th – 12th, 2013. Prior to data collection, an overview of the study's objective, a review of the sample, and question-by-question specifications were supplied to the interviewers and field supervisors. The questionnaire was reviewed in its entirety with the interviewers, with emphasis on instructions regarding call back procedures, respondent screening, termination points, skip patterns, and acceptable probes and clarifications for open-ended questions.

All interviewing was conducted by trained, professional interviewers. Interviewer calls were monitored periodically by the supervisor to ensure that all procedures are being properly followed. Upon completion, each interview was edited twice. The initial editing was done by the interviewer. An experienced supervisor followed up with a second editing. Missing answers and failed instructions were noted. If necessary, respondents were called back to complete or clarify questions. In addition, answers to open-ended questions were checked for legibility, completeness, and clarity. Monitoring and editing ensured that:

- Questions were read exactly as written, in the correct order
- Responses were recorded verbatim
- Skip patterns were followed correctly
- Natural pace was maintained
- Non-directive feedback/reinforcement was used
- Questions were not over-probed or under-probed and non-leading probes were used

Response rates are critical to ensuring the projectability of the sample. The most important factor in achieving a high response rate is callback strategy. Callbacks were made to households where there was no answer, a busy signal, an answering machine or where a callback appointment was made on the first attempt. Additional callbacks were made until the household is either determined to be ineligible or four dialing attempts have been made.

To maximize the likelihood of contacting respondents, interviewing was conducted between the hours of 5:00 p.m. and 9:30 p.m. on week nights. On weekends, calls were conducted between 10:00 a.m. and 9:30 p.m.

3.1 Understanding Margin of Error

The minimum Margin of Error (MoE) for the overall number of interviews (283) survey is ± 5.8 percentage points at the 95% confidence interval. This means that 95 out of 100 times, the reported results will be within ± 5.8 percentage points of the actual results if you were to survey the entire population of Pierce County.

The margin of error for the 150 interviews conducted in Incorporated Pierce County is ± 8.0 percentage points, and ± 6.2 percentage points for the 250 interviews conducted in Unincorporated Pierce County.

The Margin of Error for specific survey questions also depends on the number of possible responses. For some questions, the distribution of responses means the MoE can be significantly higher than the overall. However, for convenience, we use this maximum MoE as a quick way to determine if a result is statistically significant.

When comparing results across subgroups (for example, gender, age, education, etc.), the maximum MoE will grow as the number of individuals in that subgroup decreases. Because Margin of Error increases significantly as sample size decreases, care should be taken when assessing differences between subgroups.

3.2 Questionnaire Design

The intention of this research was to determine the depth of Pierce County resident's current priorities and importance of specific parks programs and other goals of Pierce County Parks and Recreation Services Department (PRS). The survey also measured their use of specific parks, waterfront areas, golf courses, and other areas and trails managed by Pierce County PRS. Respondents were initially asked about their opinions on Pierce County PRS to gauge the level of awareness of the parks services department. As the survey progressed, questions became more specific to the types of services offered within Pierce County.

4 Results

In keeping with the general flow of the survey, all demographic data will be left to the end of the report. Because of the nature of these questions, they will not be covered in detail in this written report. However, the results for these questions can be found in the topline appendix to this report.

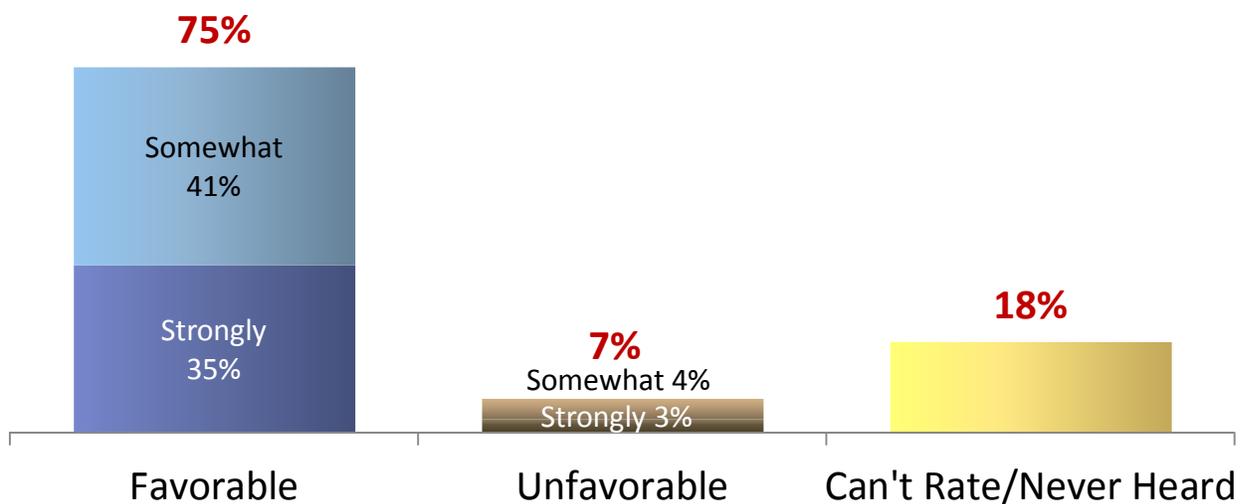
4.1 Baseline Knowledge, Awareness, and Concerns

Respondents were asked to rate their favorability of Pierce County PRS.

Question Analyzed

Q2. Do you have a favorable or unfavorable opinion of...?

Figure 1 –Pierce County PRS Favorability

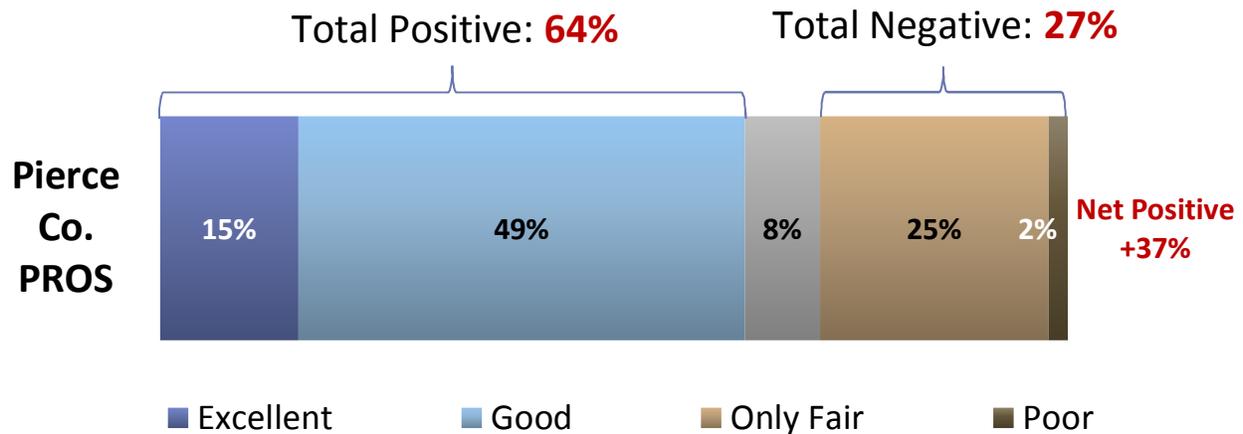


Public agency ratings are considered positive when the ration of favorable to unfavorable opinion is 2 to 1 or better. In this case, Pierce County Parks and Recreation has a significantly higher ratio of over 10 to 1 favorable to unfavorable opinion.

Question Analyzed

Q3. Using a scale of excellent, good, only fair, or poor, how would you rate the overall job Pierce County Parks and Recreation does?

Figure 2 –Job Ratings



This question sought to gauge a baseline or initial rating for Pierce County PRS to set a starting point for message testing and gauge changes in people opinion throughout the survey.

Pierce County PRS has a much higher positive job rating (64%) than negative job rating (27%) leaving it with a net positive rating of 37%. “Net positive” is the percentage who rated Pierce County PRS either Excellent or Good subtracted by those who rated them Fair or Poor. This is a strong job performance rating for a public agency.

In addition, the most extreme ratings, the “Excellent” and “Poor”, are clearly in favor of the positive side of the equation, with excellent ratings significantly higher than poor. In addition, the job performance rating is similar among those over 50 (64% Positive) and under 50 (65%) years old.

Question Analyzed

Q4-13. Pierce County Parks and Recreation developed broad goals to help support its mission of creating healthy opportunities to play, learn, connect with nature, and grow. For each of the following goals, please tell me how important you think that goal is. Use a scale of 1 to 5, where 1 means that it is “not at all important” and 5 means it is “extremely important.”

Respondents were asked a series of questions concerning services offered by Pierce County PRS and were asked to rate how important each one is on a 1 to 5 scale, with 5 being the most important and 1 the least. The graph below shows the most important ratings for the items asked.

Figure 3 –Service Importance



Categories concerning conservation of natural areas and retention of wooded space occupy three of the top four categories, the other being related to family activities. The intensity of importance for the top four items is noticeably higher than the others.

All but one of the items get two-thirds or more to say they are a 5 or a 4, the highest level of importance. This is an indication that the vast majority of items tested are important to a large proportion of residents.

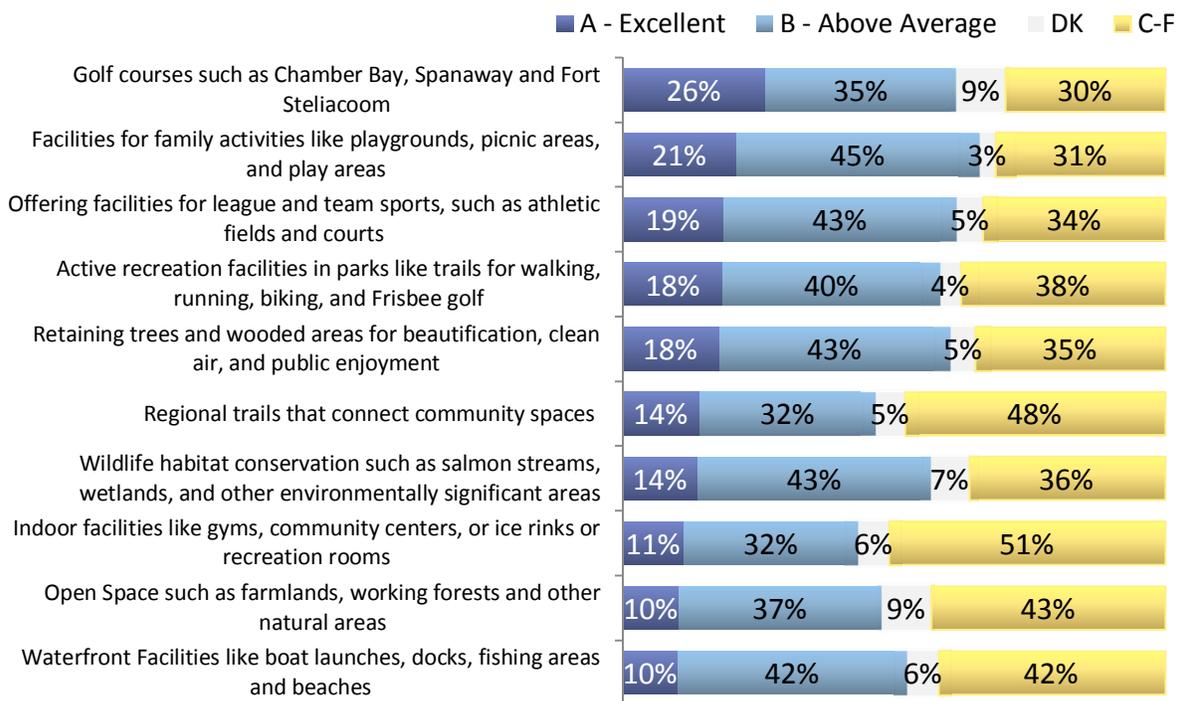
The least important item is golf courses. The total intensity (4 and 5) of importance for this item is barely higher than the lowest “5” rating for the other items tested.

Question Analyzed.

Q14-23. Thinking again about the previous goals, please tell me how well you think Pierce County Parks and Recreation is doing in each area. Use an A thru F grading scale.

The next battery of questions asked about the same categories but asked respondents to assign a grade to Pierce County for its performance on each. Grades were assigned on an A through F scale; where A is excellent, B is above average, C is average, D is below average, and F is failing.

Figure 4 –Service Performance



The categories shown here are ranked based on “A” rating given. Though golf courses are the least important item, they receive among the highest grade. There are a few items where the grade falls below 50% combined for A and B, most noticeably for regional trails, indoor facilities, and open space.

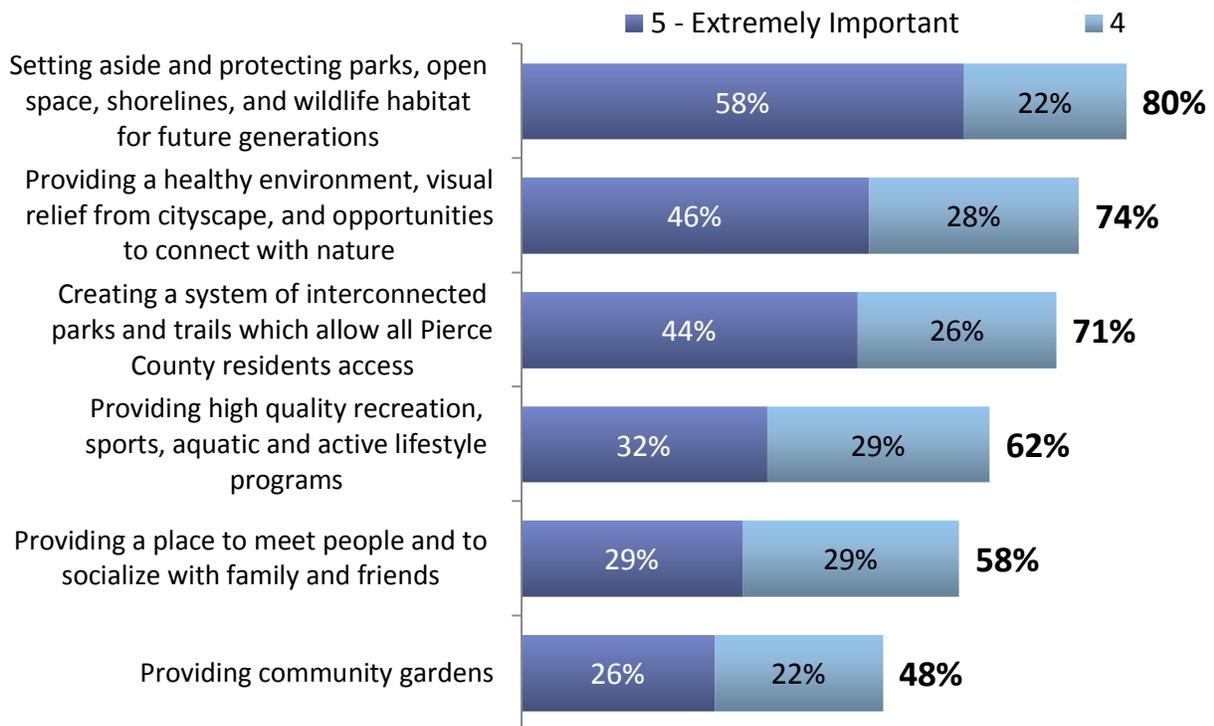
Grade ratings are generally better among those under 50 years old. The smallest difference is on wildlife habitat conservation. But on other ratings, those under 50 are 5 to 17 points more likely to give a positive grade.

Question Analyzed.

Q24-29. I'm going to read you a list of functions and services provided by Pierce County Parks and Recreation. For each one, please tell me how important that particular item is to you and your household. Use a scale of 1 to 5, where 1 means that it is "not at all important" and 5 means it is "extremely important."

We tested the importance of goals and values for Pierce County Parks.

Figure 5 –Service Importance



When placed in the context of importance for goals and values, there is a clearer stacking of the importance of specific things Pierce County might do on Park spending in the future. The highest importance is on environmentally related items, followed by wide access to parks and trails.

Those under 50 years old tend to give higher importance ratings to these services than those over 50 years old.

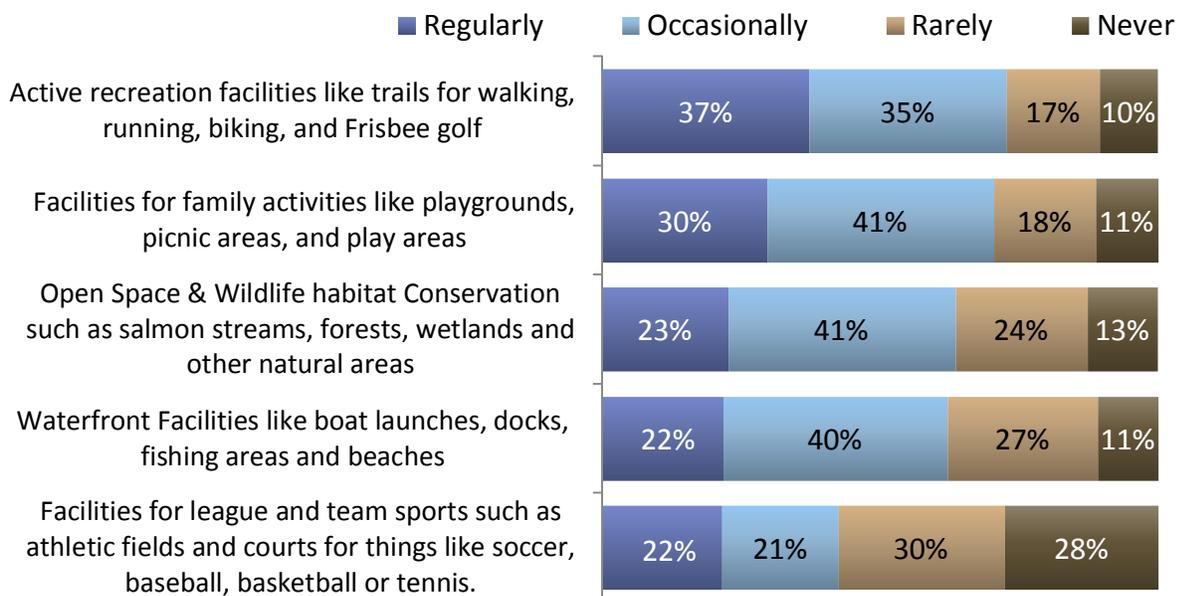
4.2 Pierce County Parks and Facility Usage

Question Analyzed.

Q30-34. Knowing that some usage is seasonal or weather dependent, how often would you say that you or someone in your household uses the following types of parks and or recreational facilities?

Our last series of questions was concerned with use. Respondents were asked how often they used certain types of parks and facilities using a scale of “Regularly”, “Occasionally”, “Rarely” and “Never”.

Figure 6 –Usage of Facilities



“Active recreation facilities” use ranked highest at 37% regular use. However, large swaths of residents use each of the facilities at least occasionally. The facilities with the highest “never” answer are facilities for league and team sports. More than a quarter (28%) don’t use these facilities.

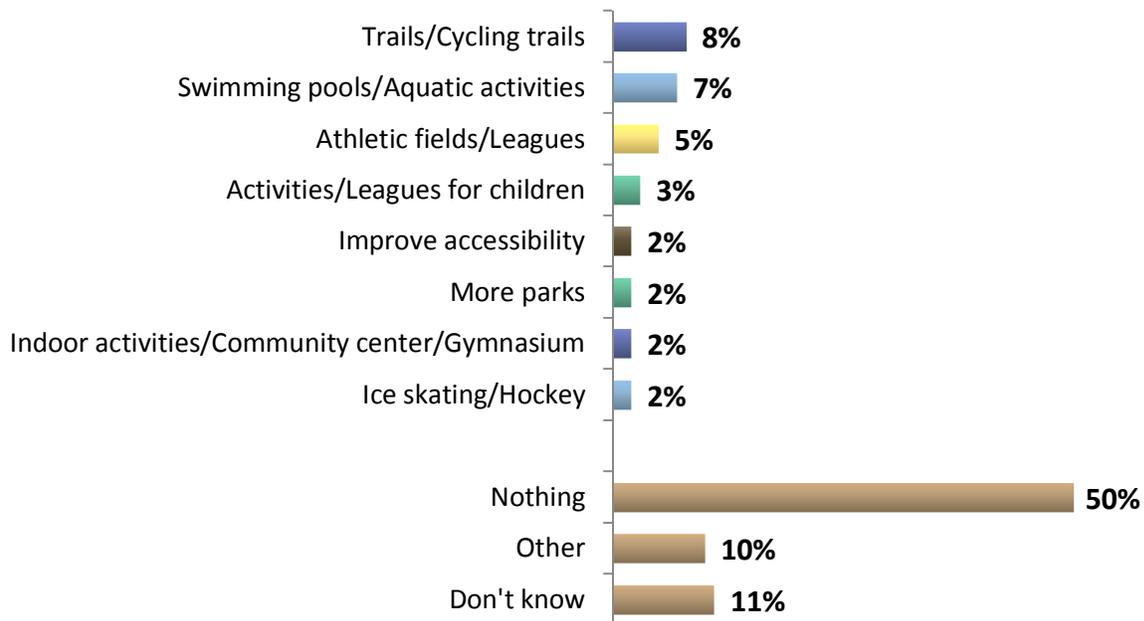
Usage of park facilities is higher among those under 50 years old, and in some cases usage is significantly higher. For example, 40% of those under 50 years old say they regularly use facilities for family activities like playgrounds, picnic areas, and play areas. Only 19% of those over 50 years old say the same.

Question Analyzed.

Q35. What specific active lifestyle and recreation programs would you like to see that aren't currently being offered?

Question 35 was posed as an open ended question, allowing respondents to voice which programs they would like to see offered that are not currently available.

Figure 7 –Concerns with Reclaimed Water in Groundwater



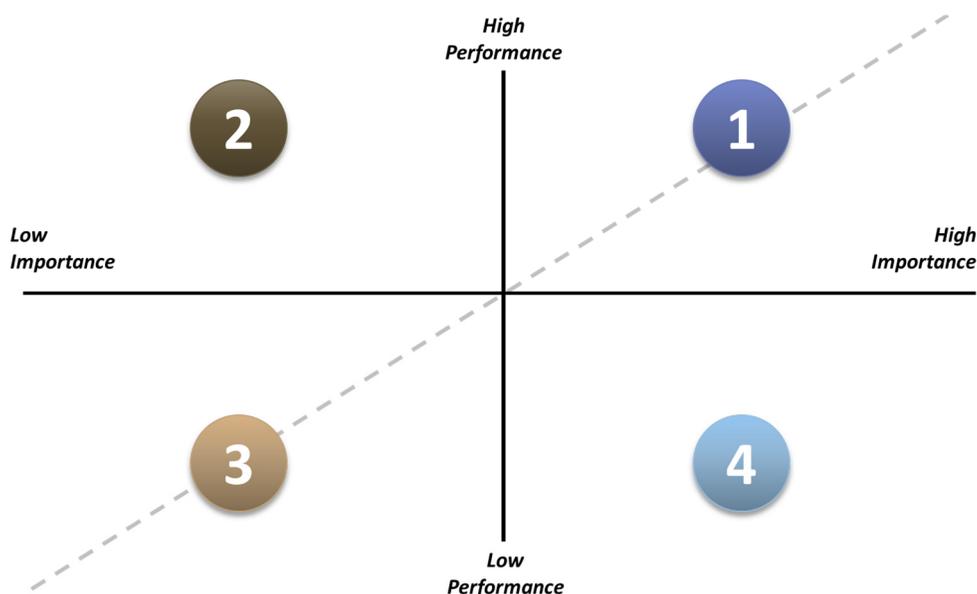
In open-ended questions, responses totaling or near 10% are typically considered significant. There are a few ways to combine answers to create larger categories, but individually the highest percentage (besides nothing) is trails and/or bicycle trails. Of the top 3 categories, all consist of active programs that require energy and movement.

4.3 Importance & Performance – Quadrant Analysis

Plotting the importance and performance on a quadrant chart allows items to be categorized in the following ways:

- 1) **High Importance & Performance** (top-right quadrant) – These are the services that residents view as very important and that PRS is doing best with. Items in this category should be considered PRS’s **most valued strengths**.
- 2) **Low Importance, High Performance** (top-left quadrant) – This quadrant represents services that citizens think PRS is doing well with but are believed to be less important. While items in this quadrant can be considered successes with certain niche groups, for most citizens, they are **not major drivers** of PRS’s favorability.
- 3) **Low Importance & Performance** (bottom-left quadrant) – Services in this category are **low-priority items** for residents and so lower performance here is not a critical issue for them. Some of these items may be raised by a vocal minority of residents but, for the most part, focusing too much on them will have a minimal impact on improving overall attitudes about PRS.
- 4) **High Importance, Low Performance** (top-left quadrant) – Services falling into this category should be viewed as **opportunities for improvement**. These are the items that residents feel are very important but PRS could be doing better with. Improving the services in this quadrant will have the greatest effect in improving citizens’ overall favorability of the PRS.

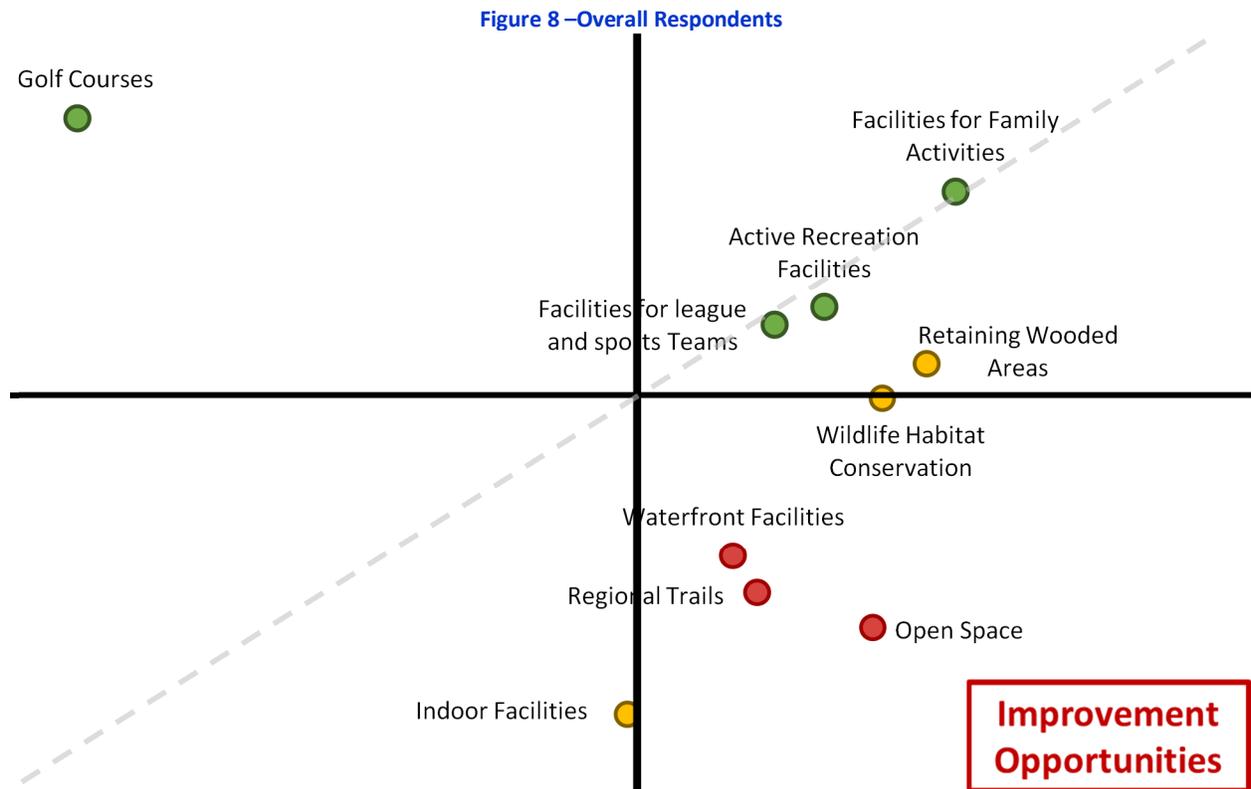
The diagonal line overlaying the chart represents where the ideal performance should be relative to the level of importance. Services falling on or near this line are performing optimally compared to how citizens value them. Items significantly left of the line may be potentially valuable improvement opportunities (even if they appear in quadrants 1 or 3) while items far right of the line may result in wasted resources if given too much focus.



Question Analyzed.

Overall Gap Analysis

This quadrant graph displays the importance vs. performance analysis for all respondents.



Based on the above data points, there are three distinct areas that all the respondents say are high importance, and are low performing (in order from worst to best performance): Open Space, Regional Trails, and Waterfront Facilities.

Retaining Wooded Areas, Wildlife Habitat Conservation, and Indoor Facilities are also areas for improvement.

The items in green are performing close to their level of importance.

Question Analyzed.

High Frequency Users Gap Analysis

A high frequency user is defined as someone who answered “Regularly” or “Occasionally” to facilities usage. The chart below looks at how high frequency users think about the same set of priorities versus importance.

Figure 9 –High frequency user respondents



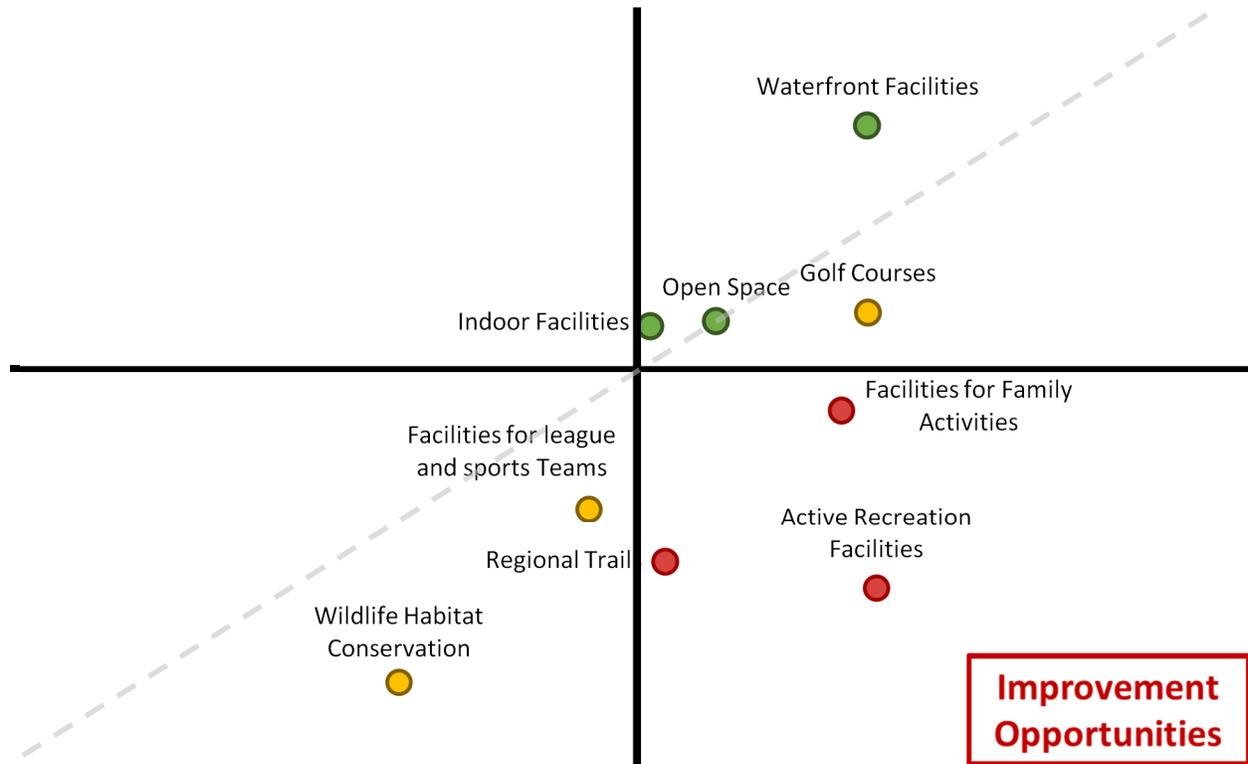
There is a shift in priority among the frequent user demographic as compared with all respondents. While this sample size is smaller than all residents, it speaks to the difference in priorities between frequent users and everyone else.

Question Analyzed.

Low Frequency User Gap Analysis.

A low frequency user is defined as a person who answered “Rarely” or “Never” to facilities usage.

Figure 10 –Low frequency user respondents



This chart shares much more in common with the overall; but there are still noticeable differences and areas for improvement.

Low frequency users see active recreation facilities as the number one improvement area, with facilities for family actives close behind, and regional trails as well. The key difference is facility usage for activity (high frequency users), and facility usage for casual/relaxation purposes (low frequency users).

5.1 Survey with Results

Pierce County PRS

Telephone Survey of Pierce County Residents

June 9th – 12th 2013
 n=283; MOE =+5.8
 EMC #13-4878

Oversample in unincorporated Pierce County n=250 MOE ± 6.2
Incorporated Pierce County n=150 MOE ± 8.0

Hello, my name is _____, may I speak with **(NAME ON LIST)**.

Hello, my name is _____, and I'm conducting a survey for EMC Research to find out how people in Pierce County feel about some of the different issues facing them. We are not trying to sell anything, and are collecting this information on a scientific and completely confidential basis.

1. **SEX (RECORD BY OBSERVATION)**

Male	47%
Female	53%

To get started, I'd like to ask your opinion of some organizations.

Do you have a favorable or unfavorable opinion of...{Qxx}? **(IF RESPONSE IS FAVORABLE/UNFAVORABLE THEN ASK FOLLOWUP: "Is that Strongly or Somewhat Favorable/ Unfavorable?") (IF RESPONSE IS "Don't know" THEN ASK FOLLOWUP: "Have you heard of them but can't rate them, or would you say you have never heard of them?")**

SCALE:	Strongly favorable	Somewhat favorable	Somewhat unfavorable	Strongly unfavorable	Heard of, Can't rate	Never Heard
---------------	---------------------------	---------------------------	-----------------------------	-----------------------------	-----------------------------	--------------------

2. Pierce County Parks and Recreation Department

34%	41%	4%	3%	15%	3%
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[END RANDOMIZE]

3. Moving on, using a scale of excellent, good, only fair, or poor, how would you rate the job the Pierce County Parks and Recreation Department is doing overall?

Excellent	15%	
Good	49%	➔ 64%
Only fair	25%	➔ 27%
Poor	2%	
Don't know/refused	8%	

Based on extensive community input, Pierce County Parks and Recreation developed broad goals to help support its mission of creating healthy opportunities to play, learn, connect with nature, and grow. For each of the following goals, please tell me how important you think that goal is for Pierce County Parks and Recreation. Use a scale of 1 to 5, where 1 means that it is “not at all important” and 5 means it is “extremely important.”

SCALE:	1	2	3	4	5	Don't know/Refused	Mean	
	Not at all important			Extremely Important				
(BEFORE EACH: How important (INSERT QX))								
(AFTER EACH IF NECESSARY- 1 is “not at all important” and 5 is “extremely important”)								
[RANDOMIZE]								
4.	is Offering facilities for league and team sports, such as athletic fields and courts for things like soccer, baseball, basketball or tennis							
	2%	3%	20%	30%	45%	0%	4.12	
5.	are Active recreation facilities in parks like trails for walking, running, biking, and Frisbee golf							
	1%	4%	16%	34%	46%	0%	4.20	
6.	are Regional trails that connect community spaces that can be used for commuting, exercising, or getting around without a car							
	3%	5%	15%	30%	45%	1%	4.10	
7.	are Facilities for family activities like playgrounds, picnic areas, and play areas							
	1%	1%	8%	35%	54%	0%	4.40	
8.	are Indoor facilities like gyms, community centers, or ice rinks or recreation rooms							
	3%	7%	21%	33%	35%	1%	3.90	
9.	are Golf courses such as Chamber Bay, Spanaway and Fort Steliacoom							
	17%	17%	27%	19%	19%	1%	3.05	
10.	are Waterfront Facilities like boat launches, docks, fishing areas and beaches							
	2%	2%	23%	31%	41%	0%	4.06	
11.	are Open Space such as farmlands, working forests and other natural areas							
	2%	4%	13%	27%	54%	0%	4.28	
12.	are Wildlife habitat conservation such as salmon streams, wetlands, and other environmentally significant areas							
	3%	3%	14%	23%	58%	0%	4.29	
13.	is Retaining trees and wooded areas for beautification, clean air, and public enjoyment							
	2%	4%	12%	20%	62%	0%	4.36	
[END RANDOMIZE]								

Thinking again about the previous goals, please tell me how well you think Pierce County Parks and Recreation is doing in each area. Use an A thru F grading scale where **A** means Excellent, **B** means Above Average, **C** is Average, **D** is Below Average, and **F** is Failing.

SCALE:	A Excellent	B Above Average	C Average	D Below Average	F Failing	Refused	GPA	
(BEFORE EACH: How well do you think Pierce County Parks and Recreation is doing with (INSERT QX))								
(AFTER EACH IF NECESSARY: A is "Excellent and F is "Failing")								
[RANDOMIZE]								
14.	Offering facilities for league and team sports, such as athletic fields and courts for things like soccer, baseball, basketball or tennis							
	19%	43%	25%	6%	2%	5%	2.73	
15.	Active recreation facilities in parks like trails for walking, running, biking, and Frisbee golf							
	18%	40%	33%	5%	0%	4%	2.74	
16.	Regional trails that connect community spaces that can be used for commuting, exercising, or getting around without a car							
	14%	32%	38%	9%	1%	5%	2.52	
17.	Facilities for family activities like playgrounds, picnic areas, and play areas							
	21%	45%	27%	3%	1%	3%	2.84	
18.	Indoor facilities like gyms, community centers, or ice rinks or recreation rooms							
	11%	32%	38%	11%	2%	6%	2.42	
19.	Golf courses such as Chamber Bay, Spanaway and Fort Steliacoom							
	26%	35%	25%	3%	2%	9%	2.89	
20.	Waterfront Facilities like boat launches, docks, fishing areas and beaches							
	10%	42%	33%	7%	2%	6%	2.55	
21.	Open Space such as farmlands, working forests and other natural areas							
	10%	37%	33%	7%	3%	9%	2.49	
22.	Wildlife habitat conservation such as salmon streams, wetlands, and other environmentally significant areas							
	14%	43%	29%	6%	1%	7%	2.67	
23.	Retaining trees and wooded areas for beautification, clean air, and public enjoyment							
	18%	43%	26%	6%	3%	5%	2.70	

[END RANDOMIZE]

I'm going to read you a list of **functions and services** provided by Pierce County Parks and Recreation. For each one, please tell me how important that particular item is to you and your household. Use a scale of 1 to 5, where 1 means that it is "not at all important" and 5 means it is "extremely important."

SCALE:	1	2	3	4	5	Don't know/Refused	Mean
	Not at all important			Extremely Important			
(BEFORE EACH: How important is (INSERT QX))							
([AFTER EACH IF NECESSARY- 1 is "not at all important" and 5 is "extremely important"])							
[RANDOMIZE]							
24.	Providing a place to meet people and to socialize with family and friends						
	6%	10%	26%	29%	29%	1%	3.66
25.	Making sure all areas of the County benefit from parks and facilities by creating a system of interconnected parks and trails which allow all Pierce County residents access						
	6%	6%	17%	26%	44%	0%	3.97
26.	Setting aside and protecting parks, open space, shorelines, and wildlife habitat for future generations						
	4%	4%	12%	22%	58%	0%	4.27
27.	Providing high quality recreation, sports, aquatic and active lifestyle programs						
	6%	6%	26%	29%	32%	0%	3.76
28.	Providing a healthy environment, visual relief from cityscape, and opportunities to connect with nature						
	6%	3%	17%	28%	46%	1%	4.06
29.	Providing community gardens						
	11%	13%	28%	22%	26%	1%	3.40
[END RANDOMIZE]							

Knowing that some usage is seasonal or weather dependent, how often would you say that you or someone in your household uses the following types of parks and or recreational facilities?

	Regularly	Occasionally	Rarely	Never	Not Sure
(READ LIST: Would you say you use them Regularly, Occasionally, Rarely, or Never?)					
[RANDOMIZE]					
30. Facilities for league and team sports such as athletic fields and courts for things like soccer, baseball, basketball or tennis.	22%	21%	30%	28%	0%
31. Active recreation facilities like trails for walking, running, biking, and Frisbee golf	37%	35%	17%	10%	0%
32. Waterfront Facilities like boat launches, docks, fishing areas and beaches	22%	40%	27%	11%	0%
33. Facilities for family activities like playgrounds, picnic areas, and play areas	30%	41%	18%	11%	0%
34. Open Space & Wildlife habitat Conservation such as salmon streams, forests, wetlands and other natural areas	23%	41%	24%	13%	0%

[END RANDOMIZE]

35. What specific active lifestyle and recreation programs would you like to see that aren't currently being offered?

(TAKE ONE RESPONSE)

Trails/Cycling trails	8%
Swimming pools/Aquatic activities	7%
Athletic fields/Leagues	5%
Activities/Leagues for children	3%
Improve accessibility	2%
More parks	2%
Indoor activities/Community center/Gymnasium	2%
Ice skating/Hockey	2%
Nothing	50%
Other	10%
Don't know	10%
Refused/Missing/NA	1%

36. Can you safely access the nearest public park or trail via foot, bicycle, or public transportation?	
Yes	76%
No	24%

Finally, I'd like to ask you a few questions for statistical purposes only.

37. Including yourself, how many people live in your household? [RECORD NUMBER]	
1	11%
2	34%
3	19%
4+	33%
Refused	2%

[IF Q38=1 OR 98, SKIP TO Q39]

38. And how many of those people are children under the age of 18? [RECORD NUMBER]	
0	51%
1	13%
2	14%
3+	22%
Refused	0%

39. Do you have a cell phone or not?	
Yes	86%
No	11%
Refused	3%

[IF Q40=2 OR 3, RESPONDENT DOES NOT HAVE CELLPHONE, SKIP TO Q42]

40. How much do you rely on your cell phone? Would you say you rely on your cell phone (READ LIST)	
All the time – it's your only phone	22%
A great deal – it's your primary phone	31%
Some – you use it occasionally	29%
Very little – you mostly have it for emergencies	16%
Don't know	0%
Refused	0%

[RESUME ASKING EVERYONE]

41. For statistical purposes, what year were you born?

18-29	16%
30-39	17%
40-49	18%
50-64	29%
65+	20%

FINISH. Those are all of my questions. Thank you very much for completing this survey. Again, this survey was for informational purposes only. Thank you and have a good day.

Public Involvement

The following presents some decision support tools involving the public in the process as the County continues to plan and develop regional trails.

Involving the Public

As specific segments of the trail are further planned, designed and developed, members of the community and specifically those potentially impacted by the trails development will need to be involved in the process. An effective public outreach strategy relies on strong organization, good preparation and consistent follow-through. The following presents an overall framework for developing a targeted and effective public involvement approach that will engage the public and key stakeholders in a meaningful participatory dialogue.

There are three main steps in an effective public outreach strategy: goal setting, audience identification, and strategy development. Step One: Goal Setting – identifies the goal of the outreach effort. Step Two: Audience Identification – identifies who will be the focus of the outreach effort. Steps one and two assist in determining the specific outreach activities and schedule, and inform Step Three: Strategy Development. This section outlines some specific considerations for the implementation of a public outreach effort in Pierce County, and for the various scales of potential trail projects and planning efforts.

Step 1: Goal Setting

What is being accomplished with the outreach effort? Is the objective to engage a broad range of people in establishing a new trail, or to just keep local residents informed of ongoing projects near their community? Time should be taken to clearly establish the specific goals of the outreach effort. This will help target the audience and ensure that outreach process is efficient and effective.

A goal or goals should include specific tangible end-results as well as more intangible “community-building” aspects. For example, two goals might be established for the outreach effort; one that includes a community empowerment and education component as well as the establishment of a new trail alignment. The goals in this case could be to “develop a public involvement process that educates the community about County trail planning efforts” and “gather specific input to determine the optimal trail alignment.” Goals should guide the development of the outreach strategy.

The first goal noted points to a need for creating educational materials for the public. The second goal suggests a need for one or more community events discussing trail alignment alternatives.

What is the scale of the effort?

The goal-setting process should include a discussion of the scale of the effort needed. The scale of the effort will have considerable implications regarding the types of outreach events and activities used. Large scale efforts will require more “expansive” or far-ranging goals that allow the County to pursue a more comprehensive outreach strategy. Smaller, more targeted efforts should have goals that allow the County to work towards more in-depth local-based efforts.

Projects impacting a large number of people, or that are particularly controversial, will require significant investments of time and resources to conduct a meaningful public outreach effort. There is a natural tendency to minimize costs for projects, and outreach components are often a place where savings can be realized. However, cutting outreach costs can lead to unintended consequences (and much higher costs) if the outreach effort does not accurately reflect the scale necessary to uncover hidden issues and effectively engage the public. Ultimately, good outreach is a cost savings measure, when done right. It helps public agencies identify innovative new ideas, keeps projects from being bogged down on controversial issues, and ultimately leads to better projects and more efficient implementation.

What type of input is needed?

Public outreach can result in a variety of types of public input. Specific technical information on issues such as alignments, trailheads, access points, etc. can be gathered. Alternatively, more qualitative input on user experiences can be collected. With the wide range of potential input, it is critical to ask what input is specifically needed to ensure that the overall planning effort is successful. This consideration should be built into the goal-setting step and should directly influence the types of outreach activities that will be conducted and the informational materials produced.

Step 2: Audience Identification

Once the goals of the outreach effort are determined, the target audience can be identified. Care should be taken to identify organized stakeholder groups, such as the businesses or various leagues and clubs that have in interest in the trails project. Identifying the appropriate audience involves

the determining the geographic reach of the project and the corresponding audience. Factoring in the scale of outreach and audience will guide the outreach effort to reach the desired audience.

Table 7.16: Sample Goal Setting Matrix

Possible Goals	Scale	Input Needed	Audience
Collect input from a wide range of stakeholders and the public to a) set project priorities; b) collect specific technical information based on local expertise; and c) raise awareness and support for the effort.	Large scale, multiple year effort	Need input to set vision and goals for the development of a high profile waterfront trail, as well as specific technical input to guide project implementation.	Multiple constituencies across the County
Ensure the public and local elected officials support the planned trail segment.	Medium scale, locally focused effort	Need community input and buy-off on a segment of a proposed trail.	City of Buckley
Provide an opportunity for local residents to state their needs and determine the best possible alternatives for plan implementation.	Small scale, neighborhood focus	Input on the formation of a public safety plan for a segment of trail running near a neighborhood.	Neighborhood located along a section of trail

Step 3: Strategy Development

Most public involvement strategies fall into a three-phase structure: visioning and analysis, concept development, and review and approval.

During Phase I: Visioning & Analysis, the focus is on gathering input from the public on key issues facing the project and analyzing the findings. In Phase II: Planning, Design & Development, staff or consultants work with the public to develop and refine potential concepts or alternative for the project for consideration by policy makers, technical experts, and the community. Phase III: Review & Approval, includes choosing the best option for the planning effort and moving forward toward approval and adoption.

Implementation of the Regional Trails Plan may involve an addition to an existing trail, the development of a proposed trail or planning for a new trail opportunity. Regardless of the project or planning phase, there are public involvement tools and strategies applicable to multiple project phases. The following describes each of the public involvement phases, and describes potential methods for scaling the activities in each phase to meet the goals and properly target the desired audience for the project. Figure J-1: Public

Involvement Template visually depicts a basic public involvement framework with the corresponding public involvement activities.

Phase 1: Vision, Issues & Opportunities

The purpose of the first phase is to introduce the project to the public and key stakeholders, and gather information on their vision and goals for the project and incorporate the public's input into the analysis of the project. This phase is essential to setting the foundation for the planning effort and sets the tone for the remaining project. This phase applies to new planning efforts or trail projects and may not be needed for projects that have undergone a planning and public outreach effort.

Items for Consideration

- Go where the people are and take advantage of existing popular events, rather than hoping for attendance at a scheduled planning meeting. Intercepting the public at events should include an education component (maps, displays, handouts, etc.) as well as an information gathering component (questionnaires, comment cards, posters to mark up, etc.).
- Hold focus groups that bring together engaged members of the community, the general public, as well as partner organizations and agencies to discuss specific topics regarding the project.
- Include a link to the web address for ongoing project information on all public information materials, including agendas, comment cards, and hand outs. All meeting materials, including handouts, agendas, meeting summaries etc. should be posted to the project website regularly.

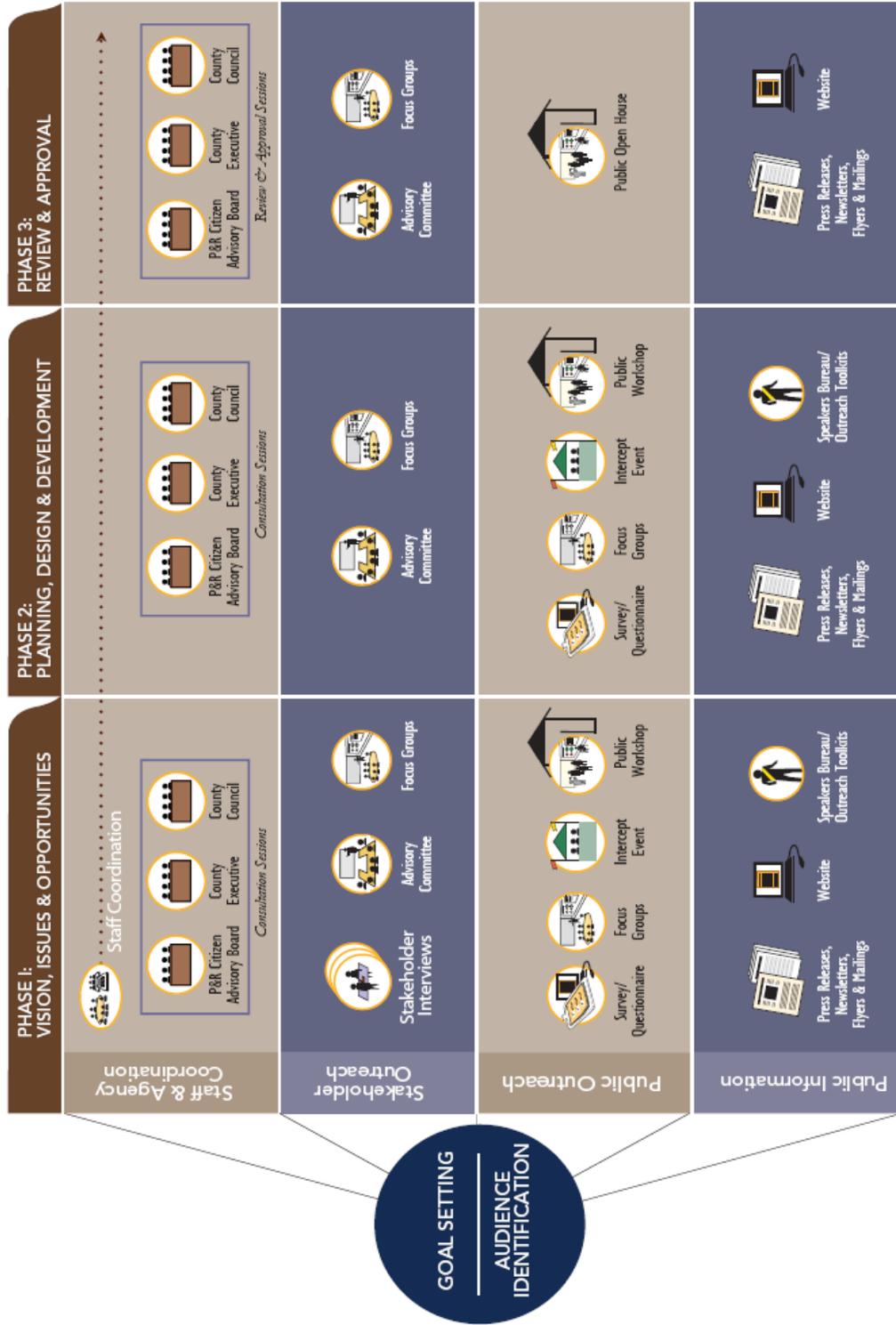
Adapting the Template to the Project

- Scale efforts according to the needs of the project. Small projects with engaged and motivated user groups or community organizations make good candidates for using focus groups and stakeholder interviews in lieu of large scale public workshops and a steering committee.
- Provide a robust outreach effort, such as a strong web presence, public service announcements, mailings and flyers, for dispersed communities in rural areas, or in areas that tend to be less engaged.

Phase 2: Planning, Design & Development

The second phase functions as an opportunity to engage the public in making the project better. This phase provides opportunities for input

PIERCE COUNTY REGIONAL TRAILS PLAN
Figure J-1: Public Involvement Template



on project alternatives and options. An honest accounting of the constraints and possibilities during this phase makes for a stronger final product.

Items for Consideration

- Hold a public workshop that requires extensive planning and preparation is a central focus for this phase. The workshop should be scheduled when people are most able to attend (weekday evenings or weekends). Consider holding companion workshops at different times and in different locations to ensure a broad cross-section of participants. The workshop should include a detailed discussion of the possible alternatives or concepts, cross-sections and drawings of the concept or design, a discussion or description of how they were developed, as well as scheduling an extended period of time for discussion and feedback from the group.
- Supplement the workshop with focus groups that may provide in depth discussion and feedback of the scale of the project requires a broad base of public feedback. A broader cross-section of the public could provide feedback online through a questionnaire or votes regarding the concepts and/or alternatives to supplement the focus groups and workshop.

Adapting the Template to the Project

- Post the alternatives/concepts online for smaller scale projects and ask people to vote or comment on them instead of holding a full scale workshop. If a workshop is not held, it is especially critical to get buy-in from elected/appointed officials and vet the concepts or alternatives with the appropriate boards and commissions.

Phase Three: Review & Approval

The final phase of the outreach effort is focused on gathering input on the final designs or concept and ensuring that the public is educated about the decision.

Items for Consideration

- Document the public outreach effort. A good public involvement effort influences the planning and design effort, demonstrates to the public that their input has been heard. Project materials, including the final concept and plan decisions should include an extensive discussion of the issues raised during the public involvement effort, and how these issues were considered and addressed.

- Hold a public open house for a large scale planning effort and provide an opportunity to gather input on the final plan or concept. Celebrate the hard work of the effort, and thank the public for their time and dedication.

Adapting the Template to the Project

- Consider taking advantage of an existing event, such as a local community fair or a school activity for smaller scale planning or projects. These events may offer a chance to get a few minutes on an existing agenda or provide a place for the County staff to set-up an information table.

Adapt the specific activities of public outreach strategy to the needs of the audience and the goals of the project. Smaller communities or smaller projects may not require the full range of outreach efforts outlined here. Providing multiple opportunities for the public to engage with the process, ensures that the public has a meaningful role and impact on decision making processes.

