



**DRAFT
KING COUNTY
SHORELINE MASTER PROGRAM**

**Appendix A:
Restoration Plan**

September 2007



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APPENDIX A SHORELINES PROTECTION AND RESTORATION PLAN September 2007

A. Purpose and General Description

Restoration planning is an important element of the environmental protection policies of the Shoreline Management Act (SMA). Local governments are required to have a “real and meaningful” strategy to address shoreline restoration as part of their shoreline master program (SMP) which implements the SMA at the local level. As part of this, they must promote restoration of shorelines based on an analysis of the nature and degree of shoreline ecological function impairment. Further, local governments are encouraged to plan for and support restoration through the SMP, as well as using other regulatory and non-regulatory programs. As part of restoration planning, it is also important to account for protection so as to prevent or minimize the need for future restoration and to ensure that restoration efforts will not be undone by future development. Thus, this appendix will address both protection and restoration as the two main elements of a restoration plan.

This report summarizes: (1) the methods and results of King County’s shoreline analysis with respect to restoration planning; (2) the ways in which shoreline restoration is currently being planned; (3) actions that are expected to contribute to shoreline restoration over time; and (4) implementation. Another section of this document (see King County Technical Appendix E) provides background on restoration, including how restoration is defined, the general approach to restoration planning, and a description of the reach and watershed characterization analysis used to assess shoreline ecological conditions. Understanding reach and watershed condition and context is critical in restoration planning to ensure that restoration actions are matched to the places where they will be most successful and make the most difference toward restoring ecological functions.

The following is intended to meet the restoration planning requirement of the SMA and provide general guidance for future shoreline planning efforts. It is intended to build on and compliment – not replace or subvert – planning that has already been done for other purposes, such as for salmon recovery or flood hazard reduction. As such, the information herein provides a SMA perspective for those and other efforts.

B. Methods

A conceptual framework and methods similar to that of Diefenderfer et al (2006 http://www.co.jefferson.wa.us/commdevelopment/PDFS/SMPupdate/JC_RPMethods_Battelle_1'06.pdf) were used to assess the range of restoration possibilities consistent with the watershed context and condition of river or lake reaches or marine drift cells. In this framework, anthropogenic (human caused or induced) stressors and disturbances operating on ecological controlling processes at reach and watershed scales are assessed to determine extent to which

ecosystem structure, processes and, ultimately, functions are affected by anthropogenic factors (Figure 1).

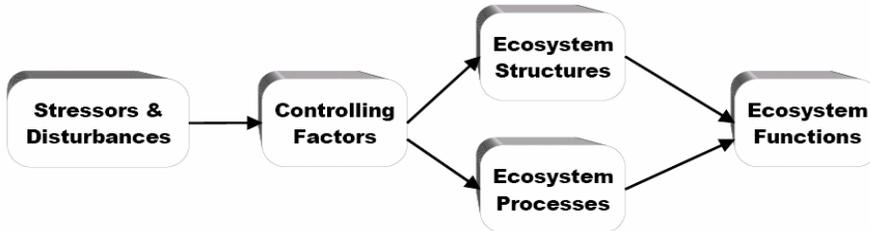


Figure 1. Conceptual model used in ecological analysis. (from Diefenderfer et al 2006)

Scores resulting from this assessment are indicative of the degree to which ecological processes have been altered and impaired. Technical Appendix E describes the specific processes considered and data sets and methods used to score each river and lake shoreline reach or marine drift cell, and their respective contributing basin. The result is that areas with similar scores and thus similar levels of impairment of ecosystem processes and structure can be grouped to provide general direction for protection and restoration actions given reach condition and context.

Stanley et al (2005) provide general recommendations depending on degree of alteration at the site and watershed scales (Figure 2). For subsequent analysis in this report, the site scale is equivalent to the lake or river shoreline reach or marine drift cell and the watershed is basin scale.

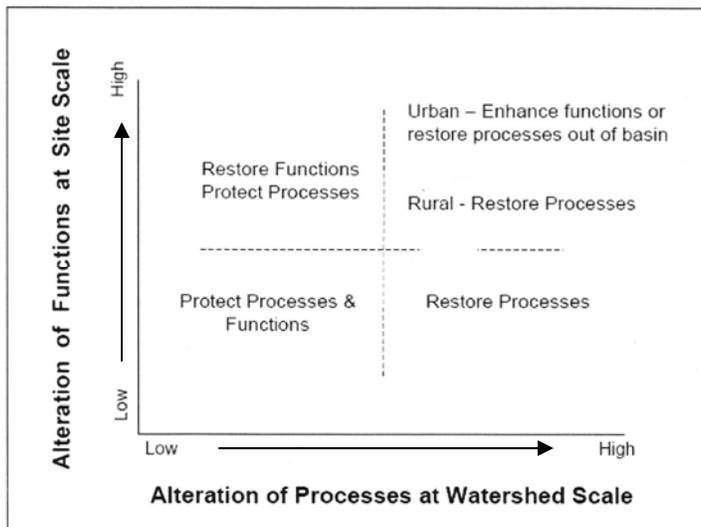


Figure 2. General recommendations from Stanley et al (2005, adapted from Shreffler and Thom (1993) and Booth et al (2004) for prioritizing protection and restoration based on degree of alteration at local (site/reach) and watershed scales. For our analysis, the local scale is equivalent to a lake or river shoreline reach or marine drift cell and watershed scale is equivalent to a basin.

Depending on condition, as indicated by the degree of alteration, reaches and drift cells were broken into one of nine categories of preferred actions (Table 1) ranging from preservation and conservation under the highest conditions (high basin and reach conditions, H:H; i.e., the least altered from natural) to enhancement and creation under the poorest condition (low basin and reach conditions, L:L, the most altered from natural).

Shoreline Reach/Drift cell Condition	Low (L)	C (H:L) Restore Enhance	F (M:L) Enhance Restore	I (L:L) Enhance Create
	Moderate (M)	B (H:M) Enhance Restore Conserve Preserve	E (M:M) Conserve Enhance Restore	H (L:M) Enhance Create
	High (H)	A (H:H) Conserve Preserve	D (M:H) Conserve Enhance Restore Preserve	G (L:H) Enhance Conserve
		High (H)	Moderate (M)	Low (L)
	Basin Condition			

Table 1. Shoreline reach or drift cell protection and restoration actions depending on condition at the basin and reach/drift cell scales (modified from Diefenderfer et al, In Prep).

The various actions¹ are defined as follows (adapted from Diefenderfer et al In Prep):

Preserve – To protect intact processes, often through acquiring lands or easements to exclude activities that may negatively affect the environment.

Conserve – To maintain biodiversity by protecting or increasing the natural potential of landscapes to support multiple native species. Typically, this is accomplished through financial incentives for landowners intended to offset any economic loss resulting from managing the land for conservation.

¹ These are actions to provide benefits over and above what regulations are expected to provide.

Restore – To transform degraded conditions to a close approximation of historical conditions. Restoration generally involves more intense and extensive modification and manipulation of site conditions than would occur with enhancement projects. Example actions include levee breaching and/or removal or setback.

Enhance – To improve a targeted ecological attribute and/or process. Example actions may include culvert replacement, riparian plantings and fencing, invasive species removal, and streambank stabilization.

Create – To construct or place habitat features where they did not previously exist in order to foster development of a functioning ecosystem. Examples include tidal channel excavation and the placement of dredge material intended to create marsh or other habitat. Creation represents the most experimental approach and, therefore, may have a lower degree of success, particularly when landscape-scale ecological processes are not sufficient to support the created habitat type.

C. Results of Shoreline Restoration Analysis

A total of 2,582 shoreline reaches and drift cells spanning 1,892 miles² and covering 66,080 acres were assessed and placed into one of the nine categories for restoration activity guidance. Table 2 summarizes the results of the analysis by shoreline type (lake, marine, and river), major watershed resource inventory (WRIA) and restoration category. River shorelines account for the greatest length (1513 miles) and area (57,973 acres), followed by lakes (327 miles and 6809 acres) and marine shorelines (52 miles and 1298 acres). Maps A1 to A4 in the Map Folio show the location of reaches by restoration type and priority action.

Overall, a very large portion (about 64 and 49 percent by length and area, respectively) of shoreline area is in the category of high basin and high reach (H:H) conditions (i.e., low degree of alterations), reflecting the large amount of county jurisdictional shoreline in forest production districts and protected areas, such as wilderness areas and municipal watersheds. Conservation and protection, particularly of the large-scale and mostly intact watershed processes, such as for sediment, hydrology and large woody debris (LWD), are the primary objectives for these areas (see Table 1).

Of the remaining categories, reaches in the moderate basin and reach condition (M:M) were second most prevalent by length and area followed by reaches in the moderate basin and high reach (M:H) and high basin and moderate reach (H:M) categories which were represented in approximately equal amounts. These reaches are largely found in rural parts of the county where a mix of land use, including both agricultural and rural residential, predominate and where basin conditions are moderate or better. With respect to SMP protection and restoration guidance, the categories for these reaches vary by whether conservation, preservation, enhancement, or restoration are part of the recommended mix of approaches.

² . Mileages differ from those cited in Section 1 of Appendix D of this report due to the manner in which reaches were split for the analysis.

The least prevalent protection and restoration categories were in the moderate basin and low reach (M:L) and low basin and high reach (L:H) conditions by area and L:H by length. The categories reflect moderate to low conditions at the basin or reach scale. For guidance, recommended actions for M:L reaches are enhancement and restoration, whereas for L:H reaches enhancement and conservation are recommended.

There were a small number of areas categorized as L:L where conditions were low at both the basin and reach scale and where enhancement and creation are the recommended actions. This category reflects high levels of alteration at both the reach and basin scales. There is a relatively small amount of L:L category because the county has little such land under its jurisdiction. For the most part, land in that category occurs in heavily developed areas along the Duwamish and Sammamish Rivers and is under city jurisdiction.

D. Achieving the SMP Restoration Goal

The County has a wide array of policies, regulations, programs, capital improvement projects and public education and stewardship activities through which much of the protection and restoration of SMP jurisdictional shorelines will be accomplished (see King County2007). Major plans and actions expected to help protect and restore shorelines are summarized below.

Comprehensive Plan: The King County Comprehensive Plan, which sets goals and accompanying policies for environmental protection in the context of population and economic growth needs, is the county's fundamental guidance document for land use and natural resource management. The first Comprehensive Plan was passed in 1964 over concerns about managing growth and its effects on the environment. In 1985, the Plan was modified to include an urban growth boundary line intended to limit growth to areas with adequate existing infrastructure and to protect natural resource lands and natural areas. Further amendments occurred with 1990 passage of the Washington State Growth Management Act, including a greater emphasis on protecting rural and natural areas and reducing the effects of sprawl by concentrating growth in existing areas of high density or where existing infrastructure can support high density. King County's first Growth Management Act comprehensive plan was adopted in 1994. Since that time the Plan has been modified (major updates occur every four years) but with no lessening of environmental goals. The Plan continues to place a priority on environmental and natural resource protection and restoration.

Land Use Regulations: All shorelines in King County's jurisdiction are protected by land use regulations, first adopted in 1990 under the sensitive areas ordinance. As a result of additional requirements of the Growth Management Act, new ordinances for critical areas protection, clearing and grading and stormwater were adopted in 2004, effective in 2005, after a multi-year assessment of needs, including extensive review and consideration of best available science. Key changes included: (1) increases in regulatory buffer widths to increase protection of habitat from direct development effects, as well as to increase protection of riparian area processes (e.g., LWD recruitment and channel migration) critical for creating and sustaining habitat and critical species, such as federally ESA-listed Chinook salmon and bull trout; (2) establishment of clearing limits to protect or minimize impacts to hydrology and other landscape level processes; and 3) increased mitigation requirements. It should be noted that the stormwater and clearing and grading regulations apply to the entire landscape, not just to critical areas or the shoreline jurisdiction, and shoreline regulations must be at least as protective of shoreline critical areas as the critical areas regulations. Thus, the combination of critical area, shoreline, clearing and grading, and stormwater regulations provides a solid foundation for protecting and restoring shoreline resources. Some variation is permitted where regulations create an undue and

potentially unconstitutional burden on a landowner, or where the landowner desires flexibility and can clearly show a net environmental benefit by taking a different approach to development. Regardless, variances will require mitigation of adverse effects. Additionally, it should be noted that by protecting regulatory buffers and upland areas from conversion to developed surfaces, passive restoration of vegetation is expected to occur in areas that are below their vegetative potential (e.g., grass or shrubs present where trees should or could grow).

Watershed Resource Inventory Area (WRIA) Plans: Puget Sound Chinook salmon and coastal bull trout were listed as threatened under the Federal Endangered Species Act (ESA) in the late 1990s. More recently (May, 2007), steelhead trout were proposed for listing under the ESA. Concern over loss and listings of salmon populations led to major and unprecedented efforts to develop comprehensive watershed plans to protect and restore salmon habitat and recover salmon populations throughout Washington State. By 2005 all of King County's WRIAs had multi-jurisdictionally adopted WRIA Plans variously called salmon conservation, recovery or habitat plans. These plans identify a large number and wide variety of programmatic, capital, and regulatory measures to protect and restore salmon and their habitat.

The salmon recovery plans are highly consistent with SMP goals because they emphasize protection and restoration of many of the same ecological processes and shoreline areas as the SMP. Chinook salmon, which are the priority species, migrate, spawn and rear along many of the same SMP jurisdictional shorelines needing restoration. Where WRIA-based salmon recovery measures extend upstream or upslope of the SMP jurisdictional area, their effects on ecological processes that control water quality, hydrology, sediment, riparian vegetation and large woody debris will likely benefit downstream or downslope shorelines. In summary, WRIA plan goals and actions are highly consistent with SMP jurisdictional area and protection and restoration needs.

Flood Hazard Management Plan (FHMP): King County has adopted the 2006 Flood Hazard Management Plan and a Countywide Flood Control Zone District. Funding for the District is expected to be determined in late 2007. In recognition that many past attempts at structural flood control have not worked well or have not been cost-effective, the FHMP outlines a series of programmatic and capital programs to reduce flood risk and costs primarily along rivers and larger streams that are also under shoreline jurisdiction. As part of this, the FHMP recommends numerous nonstructural capital projects ranging from buyout of floodplain properties and removal of associated structures and removal or set-back of flood protection facilities (levees and revetments) and restoration of associated floodplains, to smaller-scale efforts, such as elevation of homes suffering from repeated damage. Although done primarily to reduce flood risk and costs to people, significant shoreline restoration benefits will likely accrue as well. Even the smaller projects, such as elevating structures, should provide benefits as a result of reducing flood flow impediments and reducing the amount of artificial debris and pollution that occurs when houses and other structures are damaged in floods.

Programmatic and Capital Improvement Projects: Programs and capital improvement projects (CIPs), protect and restore shorelines using a range of actions including: (1) acquiring lands or conservation easements and providing tax incentives to protect rare, sensitive or otherwise critical lands for achieving species recovery and flood risk reductions goals, (2) removing or making more environmentally friendly artificial impediments, such as barriers (e.g., dams, culverts, weirs) and levees, revetments, houses and other structures, that constrain or inhibit natural processes or that degrade the environment; (3) establishing healthy, mature native plant communities; (4) creating new habitats consistent with what current processes would support and where restoration of the historic condition is not warranted due to cost of removing or modifying other constraints; and (5) educating and working with landowners and

agency staff to modify activities that adversely affect the environment and promote those that will restore and sustain shorelines.

Attachment A summarizes priority CIPs and programs proposed in the FHMP and WRIA Plans for WRIAs 7, 8, 9, and 10. Due to the overlap in geography and the interplay between flood problems and salmon habitat restoration needs, there is considerable overlap of CIPs in the flood and salmon plans. A total of 276 CIP and programmatic actions within the shoreline jurisdiction were identified (Table 3). Of these, the majority (234) are CIPs. WRIA 8 had the greatest number of proposed actions (135) followed by WRIAs 9, 7 and 10 with 69, 67 and 3 actions, respectively. There are many other actions, such as fencing, native planting and large woody debris additions, not summarized here but that are planned for and expected to occur on small tributaries and lakes outside the shoreline jurisdictional area. They are expected to help restore jurisdictional shorelines as well.

Table 3. Number of CIPs and programs in the shoreline jurisdictional area proposed by WRIA Plan for a given water type (see Attachment A for individual project summaries).

WRIA	Water Type	CIPs	Programs	Both
7	Fresh	61	8	0
8	Fresh	107	26	2
9	Fresh	45	5	0
9	Marine	18	1	0
10	Fresh	3	0	0
Total		234	40	2

Environmental Education and Stewardship: King County has an extensive history of public education, involvement, and stewardship on environmental issues, especially protection and restoration of aquatic areas (see King County 2007). Many of these efforts are conducted in concert with other jurisdictions, non-governmental organizations (aka NGOs) and local citizen and volunteer groups. Further, they are typically applied across a broad spectrum of land uses, including rural residential, agriculture (commercial and hobby farms), and forestry. In all cases, the goal is to encourage people who own or otherwise use land and aquatic areas to conduct their activities in less-impacting ways and, where possible, to restore the environment incrementally, such as by planting native plants, removing trash, and managing domestic animals, such as pets, especially their wastes. Although difficult to measure outcomes, these programs are generally believed to provide major cumulative protective and restorative benefits

as people become more aware of the effects of their actions and learn ways to reduce their impact and restore natural systems, including shorelines.

Implementation: Implementation of this plan will be guided by a variety of factors including priorities, costs, and available funding. Further, to assess success, timelines and benchmarks will be necessary. This section addresses those factors as they relate to regulations, the WRIA Plans and the FHMP.

Priorities – of the various actions to achieve protection and restoration, implementation of regulations is a high priority everywhere. Implementation of the King County FHMP is also a high priority because it addresses flood risk and costs and helps control flood insurance rates for King County citizens. The FHMP's priorities for implementing CIPs are based on the following criteria, in order of priority:

Consequences of taking no action - consequences are prioritized in order as (a) threats to public safety, (b) damage to public infrastructure, (c) impacts on the regional economy, and (d) damage to private structures,

Urgency - as a measure of how quickly an action needs to be taken to prevent a risk from growing worse,

Legal responsibility and authority – where there is a contractual relationship between King County and another person or agency, funding or partnership opportunities, and

Readiness of project – (a) is the project within an adopted local hazard mitigation plan? (b) do property interests need to be acquired (fee simple or easement)? (c) if property interests need to be acquired, is the landowner willing to sell? and (d) the anticipated project start date.

Although the FHMP's main goal is reduction of flood hazard risk, shoreline benefits accrue due to the secondary effects of removing or setting back flood protection facilities and associated development, or modifying flood protection facilities or elevating buildings *in situ* using methods that reduce effect of flooding on the structures. The result is that shorelines and associated floodplains are restored wholly or in part and remaining structures are designed with features that enhance habitat and water quality.

In contrast to regulations and the FHMP, implementation of WRIA Plan recommendations is voluntary for King County and other local governments. Regardless, they are a high priority for King County and the County uses the WRIA Plans to guide much of its capital investment in habitat protection and restoration. WRIA salmon recovery plans prioritize actions based on the degree to which listed salmonids, primarily Chinook, are expected to benefit.³ The plans prioritize actions that protect and restore Chinook-bearing watersheds and habitats, including rivers, large tributaries, estuaries and marine nearshore environments and associated

³ Chinook are the priority species because bull trout habitat recovery needs generally coincide with those for Chinook habitat, i.e., protecting and restoring headwaters and floodplains and improving edge and in-channel habitat complexity. Also, while the plans were developed prior to the federal Endangered Species Act (ESA) listing of steelhead trout, they are expected to be updated to account for steelhead recovery needs as well. Much steelhead habitat coincides with Chinook habitat, although steelhead will often use higher elevation and smaller streams than Chinook for spawning and rearing. As a result, the addition of steelhead as a priority species is not expected to modify the basic approach for habitat in recovery plans and may ultimately increase the emphasis for protection and restoration of SMP shorelines, particularly those used by steelhead but not by Chinook.

floodplains and wetlands. As a result, almost all of the priority actions of the WRIA plans contribute in some way to protection and restoration of SMP shorelines.

Costs and Funding – Costs for implementing the FHMP and WRIA plans have been identified and funding mechanisms are either in place or imminent. It should be noted, however, that both are subject to change due to uncertainty of funding, which can change due to economic and social change, and CIP costs caused by design, permitting and landowner uncertainty.

For the FHMP, the current 10-year implementation costs are projected as \$252M. The total cost of the FHMP is estimated to be between \$283M for the current published plan to \$360M when costs of the recent (2006) flood and additional city projects are included. If as yet unevaluated and unranked additional city-based projects are included, the total costs of the FHMP could be as much as \$415M. The FHMP program is proposed to be financed using a county-wide levy. The levy rate has not yet been decided by King County Council, but their decision is expected in the latter half of 2007. If funded at the proposed 10-cent/\$1k assessed property value, about \$252M would be generated to implement the FHMP over the first 10 years (2008 to 2018).

For WRIA Plans, the available funding scenarios are considerably more complex. Over the next ten years for all of Puget Sound WRIsAs, a base level of at least \$60M/year is expected from federal sources alone, assuming positive results over time (Margaret Duncan, Shared Salmon Strategy, personal comm.). These funds will be matched to some degree by state and local funds and are to be allocated among WRIsAs based on a formula that takes into account the number of chinook populations at risk and number of shoreline miles within each WRIA. For the near term, potential three-year project and programmatic costs and annual funding available from state and federal sources have been summarized by the Shared Strategy for each WRIA (Table 4, for source see <http://www.sharedsalmonstrategy.org/watersheds.htm>). The three-year costs far exceed funding as they represent the costs of doing all the projects that a watershed has identified as “ready to go” based on Chinook needs and capacity to implement if funding was not a constraint. Funding is limited, however, to the amount available to a watershed from state and federal sources plus additional matching dollars from local sources. Because state and federal funds are typically matched with local dollars for a given project, the total amount spent over the next three years is expected to exceed the federal and state funding available in Table 4. For example, for construction projects it is proposed that Puget Sound Acquisition and Recovery (PSAR) Funds must be matched with at least 15% of other dollars (Brian Abbot, The Office of the Interagency Committee (IAC) Salmon Recovery Funding Board (SRFB), June 27, 2007 memo to WRIA lead entities).

Table 4. Three-year costs and funding availability for WRIA plan implementation. Costs are for 3-year implementation of programmatic and CIP habitat actions and reflect total potential capacity to implement all “ready to go” programs and projects with Chinook benefits. Annual State and Federal funding is conservative as it does not include matching local dollars; SRFB = Salmon Recovery Funding Board; PSAR = Puget Sound Acquisition and Restoration funds. All values are in millions of dollars.

WRIA	Three-year Costs	Annual State and Federal Funding		
		<u>SRFB</u>	<u>PSAR and other sources</u>	<u>Total</u>
7	112.50	0.80	2.80	3.60
8	55.50	0.61	2.14	2.75
9	43.00	0.46	1.62	2.08
10/12	32.64	0.79	2.78	3.75
Total	243.64	2.66	9.34	12.18

Allocation of costs and funds specific to King County or its jurisdictional shorelines is not readily available. Within any WRIA, however, the majority of Plan projects and area affected are within the County's jurisdiction (although many important projects are also in incorporated areas) and, because they are along marine shorelines, rivers and larger tributaries, they are also mostly along jurisdictional shorelines. Therefore, within any given WRIA, the majority of costs and funds are expected to be focused on SMP jurisdictional shorelines.

In one instance, for WRIA 7 (the Snohomish River Basin), information on recent funding for projects specific to King County is available and summarized here for illustration of how recent funding has been allocated. The King County portion of the WRIA 7 the Snohomish River Basin Salmon Conservation Plan calls for \$45 million (\$33 million in capital projects and \$12 million in non-capital projects) to be spent on plan implementation between 2005 and 2015. Between 2005 and 2007 (3 year time period) the following sources have spent funds on capital projects: King Conservation District - \$1,630,000; Salmon Recovery Funding Board (including 2007 Puget Sound Partnership) - \$3,185,000; King County SWM Capital Budget - \$1,500,000; Conservation Futures Tax - \$1,200,000 (Perry Falcone, personal communication).

Timelines and benchmarks - As described above, restoration of SMP shorelines relies on a variety of regulatory, programmatic and CIP actions, each of which have implementation timelines and benchmarks. Revised land use regulations, including critical areas, clearing and grading and stormwater ordinances, were implemented on January 1, 2005. The FHMP is envisioned and funded as a ten-year program. Specific projects will be identified and implemented each year through the CIP budget adopted annually by the King County Council. At the end of ten years (by 2018) a range of flood-related programs and CIPs (see Attachment A for example) will have been implemented, the exact cost and number of which will vary depending on issues such as funding, permitting, and landowner willingness.

For WRIA plans, salmon recovery is the ultimate goal and benchmark against which to measure success. Recovery is generally defined as reaching the point where the listed populations are not only viable - thus eligible for delisting under the federal ESA - but also able to support viable fisheries. The timeline for this is uncertain, but expected to be longer than short or mid term, i.e., decades rather than a few years to a single decade in length. To help guide and track implementation, WRIA plans generally have regular (yearly, three or five year) assessment and reporting intervals and intermediate (three to ten year) lists of goals and associated timelines and benchmarks in addition to the ultimate goal of recovery. For example, in it's first ten years (by 2015), the Snohomish River Basin (WRIA 7) Salmon Recovery plan has identified desired

increases over current condition of eighty-three, five, four, and fifty-eight percent in estuary, edge, riparian and off-channel habitat, respectively, and forty-one new log jams (Perry Falcone, personal communication). As noted earlier, due to emphasis on Chinook, these actions will largely affect shorelines under SMP jurisdiction. It is uncertain, however, exactly how much of this work will occur in King County's jurisdiction, but the plan generally calls for roughly equal (40 to 60 percent) of the gains to be in each county.

The WRIA Plans are considered flexible because of uncertainty over how salmon will ultimately respond to the myriad of habitat, harvest and hatchery factors being addressed as well as the many other factors, such as climate and geologic processes, which are beyond local control and often difficult if to predict. Additionally, many of the programs and CIPs have uncertainty associated with costs, feasibility and funding. As a result, all plans are guided by a monitoring and adaptive management strategy to adjust the plan's goals, strategies, etc., over time.

E. Summary and Conclusion

Consistent with guidance from Washington Department of Ecology, this report provides the results of an extensive analysis of shoreline restoration need and potential actions, consistent with condition of reaches and drifts cells and their respective basin contexts, and the major policies, programs, projects, and regulations that are expected to contribute toward restoration of SMP jurisdictional shorelines. The Comprehensive Plan provides policy goals and priorities consistent with shoreline protection and restoration. Regulatory programs help to prevent further loss of riparian and landscape level development impacts and may provide incremental passive restoration benefits as vegetation in degraded riparian areas matures over time. These policies and regulations set the stage for major shoreline restoration which is expected to result from implementation of WRIA and Flood Plans, each of which has a large array of CIPs and programs (many of which are common to both plans). Finally, shorelines are expected to be protected and restored through a program of public involvement and education that spans a wide range of land uses throughout the county. As a result of the above actions, shorelines should be better protected and ultimately restored relative to current conditions.

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ATTACHMENT A.

Priority programs and capital improvement projects (CIPs) that are located along and expected to provide direct protect or restoration benefits to King County's jurisdictional shorelines as recommended by watershed inventory area (WRIA) plans and the King County Flood Hazard Management Plan. Implementation will depend on availability of funding as well as detailed assessment of site conditions and costs, technical and permitting feasibility, and landowner participation.

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach mid-point)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project = CIP)
7	Cherry Creek	0.5	Cherry Creek Floodplain Restoration	Reconnect and restore 2,800 feet of Cherry Creek and combine flow of three ditches into a single naturalized stream	R	R	CIP
7	Cherry Creek	0.25	Cherry Valley Dairy Stream Enhancement	Remove fish barrier on small stream in Snoqualmie/Cherry Creek floodplain	R	R	CIP
7	Cherry Creek	0.25	Cherry Valley Pump and Floodgate Facility	Assess effect on fish survival of new pump and floodgate	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
7	Cherry Creek	0	Cherry Creek Mouth Restoration	Restore channel in previous (ca 1960) alignment and create approximately 2000 feet of new channel	R	R	CIP
7	Lower Snoqualmie River	All	Salmon Safe Certification and marketing	Promote fish-friendly agriculture	R	Both	P
7	Lower Snoqualmie River	All	Shared Goats for Snoqualmie Salmon	Low impact approach to controlling invasive plants	R	Both	P
7	Lower Snoqualmie River	All	Conservation Reserve Enhancement Program (CREP)	Protect and restore riparian vegetation through reimbursement to farmers	R	Both	P
7	Lower Snoqualmie River	All	Snoqualmie Tribal Community Conservation Corps	Use locally-based conservation corps for restoration and protection projects	R	Both	P

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach mid-point)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
7	Lower Snoqualmie River	All	Snoqualmie River Riparian Restoration on Agriculture Lands	Plant 50 acres of floodplain habitat throughout the Snoqualmie.	R	R	P
7	Lower Snoqualmie River	All	Lower Snoqualmie Restoration and maintenance	In cooperation w/ non-profit, identify and enhance 3 miles of riparian habitat, improve access to off-channel habitat, remove blockages to 1.5 miles of rearing habitat and restore a 3 acre wetland	R	R	P
7	Lower Snoqualmie River	7	Lower Snoqualmie River Early Action PIN# 0626079010	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP

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7	Lower Snoqualmie River	7.2	HerbCo Farm (Riparian)	Remove blackberry and knotweed and replant with native vegetation along 1000 feet of the Snoqualmie River.	R	R	CIP
7	Lower Snoqualmie River	9.5	Lower Snoqualmie River Early Action PIN# 1226069019	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
7	Lower Snoqualmie River	10.2	Lower Snoqualmie River Early Action PIN# 1426069004	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
7	Lower Snoqualmie River	13.8	Tolt Pipeline Protection	Construct wood piling and log revetment to halt erosion that threatens the Tolt water supply pipeline	R	P	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
7	Lower Snoqualmie River	21.8	Stillwater Habitat Restoration	Restore floodplain processes to WDFW-owned property by removing levee and revetments and restoring vegetation	R	R	CIP
7	Lower Snoqualmie River	24.3	Snoqualmie River Footbridge Off-channel Restoration	Alternatives analysis to restore filled-in side channel habitat	R	R	CIP
7	Lower Snoqualmie River	10.5	Coe-Clemons Creek Restoration	Restore creek in Snoqualmie floodplain	R	R	CIP
7	Lower Snoqualmie River	14	Deer Creek Channel Relocation	Relocate and restore channel in and adjacent to Snoqualmie floodplain	R	R	CIP
7	Lower Snoqualmie River	18.5	Oxbow Farm Channel Enhancement	Improve connectivity of oxbow with river	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach mid-point)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project = CIP)
7	Lower Snoqualmie River	22.5	Chinook Bend Reach Restoration	Remove levee and restore riparian and floodplain vegetation and processes	R	R	CIP
7	Lower Snoqualmie River	22.5	Chinook Bend Wetlands Enhancement and Creation	Enhance existing and create additional wetlands	R	R	CIP
7	Lower Snoqualmie River	22.5	Lower Snoqualmie River Early Action PIN# 0925079025	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
7	Lower Snoqualmie River	23	Camp Gilead/MacDonald Off-channel Reconnection	Remove ~ 400 feet of revetment to reconnect ~ 4 acres of off-channel habitat and wetlands and provide access to 1.3 miles of tributary habitat	R	R	CIP

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7	Lower Snoqualmie River	23	McElhoe-Pearson Levee Setback	Relocate 1,300 feet of levee to reconnect and restore floodplain	R	R	CIP
7	Lower Snoqualmie River	23.5	Lower Snoqualmie River Early Action PIN# 8656300195	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
7	Lower Snoqualmie River	30	Lower Snoqualmie River Early Action PIN# 3325079029	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
7	Lower Snoqualmie River	30.5	Lower Snoqualmie River Early Action PIN# 0424079028	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
7	Lower Snoqualmie River	34.5	Fall City Natural Area Acquisitions	Acquire habitat in heavily used Chinook spawning area	R	P	CIP

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7	Lower Snoqualmie River	27.8	Stout Property Restoration	Plant approximately 2 acres of riparian habitat along the Snoqualmie River.	R	R	CIP
7	Lower Snoqualmie River	27.7	Snoqualmie River Byers Riparian Restoration	Install a 600 foot-long "drift fence" to capture woody debris and create a natural log jam for habitat and erosion reduction	R	R	CIP
7	Lower Snoqualmie River	28	Gonneson Revetment Acquisition and Removal	Acquire floodplain area and remove bank armoring to allow for lateral channel migration and floodplain restoration	R	R	CIP
7	Lower Snoqualmie River	28.2	Jubilee Farm (Riparian)	Remove invasive species and plant a 50 to 70 foot buffer along 1 mile of the Snoqualmie River	R	R	CIP

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7	Lower Snoqualmie River	32.1	SE 19th Way Road Buyout	Purchase farm at risk of being isolated by bank erosion	R	R	CIP
7	Lower Snoqualmie River	32.5	Neal Road Relocation	Realign road currently closed due to bank failure	R	R	CIP
7	Lower Snoqualmie River	33	Snoqualmie River Fall City Reach Restoration	Reconnect and restore two side-channels	R	R	CIP
7	Lower Snoqualmie River	33	Lower Snoqualmie River Early Action PIN# 0924079012	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
7	Lower Snoqualmie River	33.2	Lower Snoqualmie River Early Action PIN# 2925079019	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP

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7	Lower Snoqualmie River	34.2	Aldair Buyout	Purchase homes and property at risk from failure of the Aldair levee	R	R	CIP
7	Lower Snoqualmie River	35.5	Fall City Levee Setback Feasibility Study	Conduct levee setback feasibility study for conveyance improvement and habitat enhancement.	R	R	CIP
7	Middle Fork Snoqualmie	All	Middle Fork Snoqualmie Invasive Weed Removal Project	Control and, if possible, eradicate invasive plants to protect high quality area	R	P	CIP
7	Middle Fork Snoqualmie	2.1	Middle Fork Levee System Capacity Improvements	Reduce flood risks caused by constrictions in segments of the incomplete levee system	R	P	CIP

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7	Miller River	0.5	Miller River Home Buyout	Purchase and remove floodprone residence and restore floodplain	R	R	CIP
7	Miller River	0.5	Miller River Road Protection	Enhance constructed log jam to reduce erosion risks to the road	R	R	CIP
7	Raging River	4.8	Raging River Preston Reach Restoration	Restore access to 7 acres of off-channel/floodplain habitat, 1200 feet of edge habitat and acquire 10 acres immediately upstream of the restoration	R	Both	CIP
7	Raging River	5.2	Alpine Manor Mobile Home Park Neighborhood Buyout	Purchase high-risk homes and property and restore floodplain	R	R	CIP

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7	Raging River	10	Raging River Kerriston Reach Restoration	Add LWD to river	R	R	CIP
7	Raging River	0.2	Lower Raging River Floodplain Restoration	Investigate alternatives to reconnecting lower Raging river to its historic floodplain	R	R	CIP
7	S.F. Skykomish River	18.3	Timber Lane Village Home Flood Buyouts	Purchase property and remove homes subject to extreme erosion.	R	R	CIP
7	S.F. Skykomish River	18.7	Timber Lane Village Home Erosion Buyouts	Purchase property and remove homes subject to extreme erosion.	R	R	CIP
7	S.F. Skykomish River	3.5	South Fork Levee System Improvements	Initiate rehabilitation of the levee system	R	R	CIP
7	Snoqualmie	All	SHRP Snoqualmie	Implement small scale restoration programs	R	R	P

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7	Snoqualmie	All	Snoqualmie Tribal Community Conservation Corps	Conduct habitat restoration projects as needed	R	R	P
7	Tolt River	7	Stoessel Creek Acquisition	Acquire key properties to protect riparian areas and associated mussel populations	R	P	CIP
7	Tolt River	3	Tolt River Road Shoulder Protection	Protect road from channel migration	R	P	CIP
7	Tolt River	4.6	San Souci Acquisition	Acquire frequently-flooded properties to remove flood risks and restore floodplain processes	R	R	CIP
7	Tolt River	0.6	Tolt River SR 203 to Trail Bridge Floodplain Reconnection	Setback levee to improve conveyance and allow habitat enhancement	R	R	CIP

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7	Tolt River	1.1	Tolt River Mile 1.1 Levee Setback	Setback levee to improve conveyance and allow habitat enhancement. Include purchase and removal of homes	R	R	CIP
7	Tolt River	2	Tolt River Natural Area Floodplain Reconnection/Acquisition	Acquire property in old side channel, remove a levee and reconnect and restore side channel	R	R	CIP
7	Tolt River	2	Tolt River Restoration	Restore 54 acres along river	R	R	CIP
7	Tolt River	0.3	Lower Tolt River Levee Setback(s) and Restoration	Setback levee and restore floodplain of lower Tolt river	R	R	CIP
7	Tolt River	0.3	Tolt River Mouth to SR 203 Floodplain Reconnection Technical Support	Provide technical support for floodplain reconnection project	R	R	CIP

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7	Tolt River	1	Tolt River Flood Early Action PIN 2125079024	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
7	Tolt River	1	Tolt River Flood Early Action PIN 2125079038	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
7	Tolt River	26	Lower Snoqualmie River Early Action PIN# 2825079011	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
7	Upper Snoqualmie	43	Three Forks Natural Area Restoration	Remove non-native plants and replant 35 acres of formerly grazed lands	R	R	CIP
8	Bear Creek	3	Reach 5 (RM 2 to 4) - protection	Protect floodplain and wetland areas adjacent to Keller Farm property (spans Reaches 4 and 5)	R	P	CIP

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8	Bear Creek	4.5	Reach 6 (RM 4 to 4.75) - protection	Protect forested areas in reach, particularly south of Puget Power Trail & at 116th and Avondale Rd., and forested buffers and undeveloped properties	R	P	CIP
8	Bear Creek	5.25	Reach 7 (RM 4.75 to 5.9) - protections	continue Waterways program, especially at Classic nursery, and flows, contiguous forest cover and riparian forest in reach	R	P	P

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8	Bear Creek	6.25	Reach 8 (RM 5.9 to 6.5) - protection	Protect Bear Creek Waterways Reach D, particularly forested riparian parcels contiguous to already protected areas and Swanson Horse Farm, as well as flows and upland and riparian forest cover,	R	P	P
8	Bear Creek	4.5	Reach 6 (RM 4 to 4.75) - restoration	Restore riparian vegetation in Friendly Village development & equestrian center and reduce bank armoring and restore riparian vegetation in vicinity of NE 116th & Avondale Pl.	R	R	CIP

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8	Bear Creek	All	LWD addition	Add LWD in select locations as identified in need and feasibility study	R	R	CIP
8	Bear Creek	3	Reach 5 (RM 2 to 4) - restoration	Restore channel conditions through a former dairy farm and install buffer strips (spans reaches 4 and 5).	R	R	CIP
8	Bear Creek	5.25	Reach 7 (RM 4.75 to 5.9) - restoration	Work with property owners to add LWD, restore riparian vegetation and reforest cleared areas	R	R	P
8	Carey Creek	1	Reach 1 (RM 0.0 to 1.8) - protection	Implement waterways recommendations	R	P	CIP
8	Carey Creek	3	Reach 3 (RM 2.5 to 3.5) - protection	Implement waterways recommendations	R	P	CIP

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8	Carey Creek	3.2	Carey Creek Culvert Removal	Remove large culvert (~ RM 3.2 on Carey Creek) to facilitate movements of fish and other ecosystems materials	R	R	CIP
8	Cedar River	5.5	Cedar River Early Action PIN# 2323059098	Acquire floodplain property and remove structures in anticipation of larger flood hazard reduction and floodplain restoration	R	R	CIP
8	Cedar River	13.9	Cedar River Early Action PIN# 3223069017	Acquire floodplain property and remove structures in anticipation of larger flood hazard reduction and floodplain restoration	R	R	CIP

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8	Cedar River	13.9	Cedar River Early Action PIN#3223069089	Acquire floodplain property and remove structures in anticipation of larger flood hazard reduction and floodplain restoration	R	R	CIP
8	Cedar River	19.5	Cedar River Early Action 232206-9086	Acquire floodplain property and remove structures in anticipation of larger flood hazard reduction and floodplain restoration	M	R	CIP
8	Cedar River	17	Cedar River Early Action PIN# 6399600105	Acquire floodplain property and remove structures in anticipation of larger flood hazard reduction and floodplain restoration	R	R	CIP

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8	Cedar River	17	Cedar River Early Action PIN# 6399600140	Acquire floodplain property and remove structures in anticipation of larger flood hazard reduction and floodplain restoration	R	R	CIP
8	Cedar River	17	Cedar River Early Action PIN# 6399600145	Acquire floodplain property and remove structures in anticipation of larger flood hazard reduction and floodplain restoration	R	R	CIP
8	Cedar River	15	Cedar River Early Action 510840-0040	Acquire floodplain property and remove structures in anticipation of larger flood hazard reduction and floodplain restoration	R	R	CIP

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8	Cedar River	15	Cedar River Early Action 510840-0041	Acquire floodplain property and remove structures in anticipation of larger flood hazard reduction and floodplain restoration	R	R	CIP
8	Cedar/Bear/Issaquah	All	Rural opportunity fund	Implement habitat protection and restoration actions as opportunities arise	R	Both	P
8	Cedar/Bear/Issaquah	All	Riparian restoration	Based on individual site needs, work with landowners to remove bank armoring, livestock and non-native plants and restore native plants	R	R	P

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8	Cottage Lake Creek	3.75	Cottage Lake/Cold Creek Acquisition	Acquisition to protect critical cold water springs near outlet of Cottage lake	R	Both	CIP
8	Cottage Lake Creek	0.25	Reach 1 (RM 0.0 to 0.5) - protection	Implement Waterways Reach E, protect flows and upland and riparian forest cover and work with landowners to increase channel complexity and reforest cleared areas	R	P	CIP

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8	Cottage Lake Creek	0.75	Reach 2 (RM 0.5 to 1.0) - protection	Protect 40-acre parcel on Cottage Lake Creek (Nickels Farm) and protect flows and upland and riparian forest cover work with landowners to increase channel complexity and reforest cleared areas	R	P	CIP
8	Cottage Lake Creek	3.75	Cold Creek Natural Area Bog Restoration	Restore altered areas of bog	R	R	CIP
8	EF Issaquah	3.5	Reach 3 (RM 2 to 5) - protection	Acquire additional forested areas along creek	R	P	CIP
8	Evans Creek	1	Reach 3 (RM 0.75 to 1.25) - protection	Protect existing habitat in undeveloped Johnson Park	R	P	CIP

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8	Evans Creek	1.75	Reach 4 (RM 1.25 to 2.25) - restoration	Conduct pilot project to reduce sedimentation, invasive reed canary grass, and to restore riparian vegetation	R	P	CIP
8	Evans Creek	1.75	Reach 4 (RM 1.25 to 2.25) - protection	Work with private property owners in reach to protect existing wetlands.	R	P	P
8	Evans Creek	3	Reach 5 (RM 2.25 to 3.5) - restoration	Move Evans Creek away from Redmond Fall City Road, re-meander, increase buffer and channel complexity and restore riparian vegetation	R	R	CIP

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8	Evans Creek	1	Reach 3 (RM 0.75 to 1.25) - restoration	Restore channel in Johnson Park and work with landowners elsewhere to restore instream and riparian habitat	R	R	P
8	Holder Creek	2.25	Reach 3 (RM 1.5 to 3) - protection	Acquire in-holdings on Taylor and Tiger mountains and protect forest cover	R	P	CIP
8	Holder Creek	1.25	Reach 2 (RM 1 to 1.5) - protection	Acquire 80-acre in-holding in Taylor Mountain Forest	R	P	CIP
8	Issaquah Creek	All	Holder Creek LWD addition	Add LWD where needed and feasible	R	R	CIP

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8	Issaquah Creek	10	Reach 12 (RM 8.9 to 11.4) - protection	Protect 120 acre confluence area of Carey, Holder and Issaquah Creeks (includes Reach 1 on Carey and Holder Creeks, respectively) and several large parcels adjacent to log Cabin Reach	R	P	CIP
8	Issaquah Creek	6	Reach 9 (RM 5.5 to 7.0) - protection	Work with private property owners to increase stream buffer protection	R	P	P
8	Issaquah Creek	8	Reach 11 (RM 7.5 to 8.9) - protection	Issaquah Creek Waterways, particularly Log Cabin Reach	R	P	P
8	Issaquah Creek	7.25	Reach 10 (RM 7 to 7.5) - protection	Work with private property owners to increase stream buffer protection	R	P	P

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8	Issaquah Creek	8	Reach 11 (RM 7.5 to 8.9) - restoration	Restore minor areas of otherwise high quality Log Cabin reach, assess removal of bank hardening in Four Creek subdivision area and work with landowners to improve water quality, in-channel and riparian conditions	R	R	Both
8	Issaquah Creek	7.25	Reach 10 (RM 7 to 7.5) - restoration	Assess landfill and septic system effects and work with property owners to restore habitat implement best management practices to reduce water quality impacts	R	R	Both

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8	Issaquah Creek	9	Issaquah Creek Early Action PIN# 2223069015	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP
8	Issaquah creek	11	Issaquah Creek - SE 252nd Restoration	Restore reach of Issaquah creek	R	R	CIP
8	Issaquah Creek	10	Reach 12 (RM 8.9 to 11.4) - restoration	Restore Holder/Carey confluence (if acquired) and work with property owners to restore habitat and implement best management practices to reduce water quality impacts	R	R	CIP
8	Issaquah Creek	7	Issaquah Creek Early Action PIN# 2616800580	Elevate structure(s) in floodplain to reduce flood damage risk	R	R	CIP

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8	Issaquah Creek	8	Log Cabin Reach (RM 7.75 to 8.25) Wetlands	Remove non-native plants and restore native vegetation at select sites along up to 1.25 miles of Issaquah Creek	R	R	P
8	Issaquah Creek	6	Reach 9 (RM 5.5 to 7.0 - restoration	Work with property owners to restore habitat and implement best management practices to reduce water quality impacts	R	R	P
8	Lake Washington	N/A	O.O. Denny Park Bulkhead Removal	Remove bulkhead on Lake Washington and restore shoreline	L	R	CIP
8	Lower Cedar River	7.3	Cedar Rapids Floodplain Levee setback and Restoration	Restore floodplain vegetation and natural features in area of levee removal or setback	R	Both	CIP

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8	Lower Cedar River	7.3	Cook/Jeffries	Protect buffer and reconnect side-channel	R	Both	CIP
8	Lower Cedar River	5	Cedar - Riparian areas upstream of landslide	Protect riparian vegetation on county land upstream of landslide	R	P	CIP
8	Lower Cedar River	7.3	Cedar River Trail/SR 169 Riparian protection	protect intact riparian forest along trail and SR 169	R	P	CIP
8	Lower Cedar River	12	Byers Reach Protection	Protect 58 acres of riparian and floodplain areas	R	P	CIP
8	Lower Cedar River	12.7	Taylor Creek Mouth	Protect 40 acres of forested floodplain at mouth of Taylor Creek	R	P	CIP
8	Lower Cedar River	13.5	218 Side Channel	Protect 5 acre of floodplain with side channel	R	P	CIP

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8	Lower Cedar River	14	Protect Royal Bend	Protect floodplain and steep slopes	R	P	CIP
8	Lower Cedar River	4	Cedar Maplewood	Explore possible flood buyouts and levee setback or removal opportunities	R	R	CIP
8	Lower Cedar River	5.5	Old Elliot Bridge	Removal of old Elliott Bridge and buyouts of repetitive loss properties	R	R	CIP
8	Lower Cedar River	6.5	Cavanaugh Pond	Remove invasive plants and restore natural vegetation	R	R	CIP
8	Lower Cedar River	6.5	Herzman Levee	Remove or setback levee to reconnect the river with its floodplain	R	R	CIP

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8	Lower Cedar River	6.5	Lower Jones Rd/Bucks Curve	Acquire key properties and restore riparian and floodplain functions and processes	R	R	CIP
8	Lower Cedar River	7	Cedar Brassfield	Explore possible flood buyouts and levee setback or removal opportunities in a reach constrained by levees on both banks.	R	R	CIP
8	Lower Cedar River	7	Riverbend Trailer Park	Purchase and remove select number (or possibly all) mobile homes nearest river, recontour revetment to reduce erosion, flood damage and improve flood conveyance and habitat	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
8	Lower Cedar River	7.3	Cedar Rapids Floodplain Acquisition	Acquirer 15 acres of floodplain for restoration	R	R	CIP
8	Lower Cedar River	8.2	Cedar Scott-Indian / Jones Reach	Acquire homes subject to undermining behind levee, setback levee and restore floodplain	R	R	CIP
8	Lower Cedar River	8.2	Progressive Investment	Remove remainder of progressive investment levee and restore floodplain	R	R	CIP
8	Lower Cedar River	9.4	Cedar Littlefield-Cummings / Belmondo	Acquire and restore ten floodplain parcels with many side channels covering 71 acres.	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project = CIP)
8	Lower Cedar River	10.9	Cedar Mountain Revetment	Remove revetment and restore riparian and floodplain area	R	R	CIP
8	Lower Cedar River	11	Cedar Grove Road Removal	In conjunction with buyouts, remove access road and restore floodplain	R	R	CIP
8	Lower Cedar River	11	Cedar Grove Junkyard	Buyout and remove junkyard and restore floodplain	R	R	CIP
8	Lower Cedar River	11	Cedar Grove Mobile Home Park	Buyout and mobile home park and remove levee	R	R	CIP
8	Lower Cedar River	11	WPA Levee Setback and floodplain restoration	Acquire floodway homes, setback levee and restore floodplain currently behind WPA levee	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
8	Lower Cedar River	11.2	Rainbow Bend (aka Cedar Grove) Mobile Home Acquisition Project	Acquire and remove flood-prone mobile home park and homes and associated structures, and decommission and remove supporting infrastructure	R	R	CIP
8	Lower Cedar River	11.5	Rainbow Bend Levee Setback and Floodplain Reconnection	Setback or remove levee to accommodate of flooding and natural riverine processes and potentially construct side channels and associated floodplain features.	R	R	CIP
8	Lower Cedar River	11.7	McDonald Levee	Pursue additional buyouts near levee and restore floodplain	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project = CIP)
8	Lower Cedar River	11.8	Lower Lions Creek	Acquire key properties and restore riparian and floodplain functions and processes	R	R	CIP
8	Lower Cedar River	12	Byers Reach Restoration	Remove levee and restore floodplain	R	R	CIP
8	Lower Cedar River	12	Lions Club Channel Restoration	Revegetate floodplain	R	R	CIP
8	Lower Cedar River	12.7	Taylor Creek LWD	Add LWD to lower reaches of Taylor Creek	R	R	CIP
8	Lower Cedar River	13.4	Jan Road Floodplain Reconnection	Remove or setback approximately 500 linear feet of raised embankment from the downstream end of each of the Jan Road Levee and the Rutledge-Johnson levees	R	R	CIP

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8	Lower Cedar River	13.5	218 Side Channel Enhancement	Enhance side channel after protected	R	R	CIP
8	Lower Cedar River	13.8	Getchman Acquisition and Levee setback	Acquire land and setback levee to restore floodplain functions and processes	R	R	CIP
8	Lower Cedar River	14	Rhode Levee Setback and Home Buyouts	Acquire and remove structures, setback levee and restore floodplain	R	R	CIP
8	Lower Cedar River	14.2	Royal Arch revetment	Explore potential for removal of revetment	R	R	CIP
8	Lower Cedar River	14.5	Peterson Creek mouth	Add LWD at mouth and consider use of LWD to facilitate fish passage at mouth	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
8	Lower/Middle Cedar River	All	SHRP Cedar	Implement small scale restoration programs	R	R	P
8	Lower/Middle Cedar River	All	Side channel inventory and evaluation	Inventory and assess side channels for restoration potential	R	R	P
8	Middle Cedar River	16.5	Reach 15 Protection	Protect 15 acres of forested floodplain upstream of county owned land	R	P	CIP
8	Middle Cedar River	17	Reach 16 - priority protections	Protect RB gravel sources and unstable right bank above Cedar River Trail Bridge and LB floodplain downstream of BN Nose	R	P	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project = CIP)
8	Middle Cedar River	20	Landsburg Reach	Protect 87 acres of forested floodplain and unarmored slopes	R	P	CIP
8	Middle Cedar River	16	Dorre Don Meanders	Protect 71 acres of forested floodplain with side channels	R	P	CIP
8	Middle Cedar River	17	BN Nose restoration	If BN Nose is protected, then restore floodplain	R	R	CIP
8	Middle Cedar River	17.5	Cedar Orchard Grove	Acquire floodprone parcels and restore floodplain	R	R	CIP
8	Middle Cedar River	20.1	Wingert Side Channel	Enhance side channel with LWD and plantings	R	R	CIP
8	Middle Cedar River	20.2	Revetments @ RM 20.2 and 20.6	remove old revetments and restore riparian areas	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
8	Middle Cedar River	21.5	Wetland 69	Reconnect wetland 69 (an oxbow) to river	R	R	CIP
8	Middle Cedar River	16	Cedar Dorre Don /Dorre Don Meanders	Acquire flood-prone properties in lower Dorre Don area and modify levees and restore floodplain where feasible for reconnection of floodplain with the river	R	R	CIP
8	Rock Creek	0	Rock Creek - Fish Passage	Assess options to improve fish passage at mouth	R	R	CIP
8	Rock Creek	0.05	Rock creek - confluence area floodplain	Buyout RB house and restore floodplain at mouth	R	R	CIP

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8	Rock Creek	0.1	Lower Rock Creek Channel Rehab Feasibility Study	Assessment of feasibility to restore natural channel conditions in lower part of Rock Creek	R	R	CIP
8	Rock Creek	0.1	Rock Creek - Off-channel habitats	Assess feasibility of increasing off-channel habitat	R	R	CIP
8	Sammamish River	11	Reach 5 (RM 10 to 12.25) - restoration	Restore and create pools at mouth of Bear Creek, regrade banks to create shallow rearing habitat and restore riparian vegetation and enhance two tributary confluences	R	R	CIP

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8	Sammamish River	13	Reach 6 (RM 12.25 to 13.75) - restoration	Implement the Sammamish River Transition Zone Restoration projects and restore channel, riparian and tributary mouth conditions	R	R	CIP
8	Sammamish River	13.5	Willowmoor	Reconfigure outflow from Lake Sammamish to maintain or reduce current flood risk and to reduce impacts on fish and wildlife	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
8	Sammamish River	6	Reach 3 (RM 5 to 7.5) - restoration	Restore banks, shallow rearing habitat and riparian vegetation, enhance tributary confluences, and enhance and reconnect riparian wetlands near Gold Creek and I-405/SR 522 Interchange	R	R	CIP
8	Sammamish River	8	Reach 4 (7.5 to 10.5) - restoration	Restore meanders, bank in-channel and tributary confluence conditions	R	R	CIP
8	Upper Cedar River	All	Cedar HCP	Implement City of Seattle Habitat Conservation plan projects	R	Both	P
8	Upper Cedar River	All	HCP flows	Maintain flow commitments in HCP	R	Both	P

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach mid-point)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
8	Upper Cedar River	22	Reach 19 - Instream	Improve habitat in Landsburg Impoundment pool	R	R	CIP
8	Upper Cedar River	22	Reach 19 - LWD	Install engineered logjams near RM 22	R	R	CIP
8	Upper Cedar River	22	Reach 19 - Riparian	Enhance riparian habitat on both sides of river	R	R	CIP
8	Upper Cedar River	23	Reach 29 - Flow diversion	Restoration of flows to Upper Rock Creek	R	R	CIP
8	Upper Cedar River	23	Flow refuge creation	Install rock structures to create flow refuges	R	R	CIP
8	Upper Cedar River	23	Upper Rock Creek - confluence restoration	Restore confluence of Upper Rock Creek	R	R	CIP
8	Upper Cedar River	30	Upper Taylor Creek confluence restoration	Restore confluence of Upper Taylor Creek	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project = CIP)
8	Upper Cedar River	32	Reach 24 - Riparian	Enhance riparian habitat on both sides of river	R	R	CIP
8	Upper Cedar River	33.1	Reach 25 - Instream	Facilitate instream pool structure, habitat diversity and floodplain connections in reach	R	R	CIP
8	Upper Cedar River	33.1	Reach 25 - Riparian	Enhance riparian habitat on both sides of river	R	R	CIP
8	Upper Cedar River	33.5	Reach 26 - Instream	Facilitate instream pool structure, habitat diversity and floodplain connections in reach	R	R	CIP
8	Upper Cedar River	33.6	Reach 26 - Riparian	Enhance riparian habitat on both sides of river	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
8	Upper Cedar River	34	Decommission Road 71	Remove road and restore area	R	R	CIP
8	Upper Cedar River	23	Reach 20 - Roads	Road decommissioning and improvement in Upper Rock Creek	R	R	P
8	Upper Cedar River	23	Reach 29 - Riparian	Enhance riparian habitat through adding vegetation and ecological thinning on both sides of Upper Rock creek	R	R	P
8	Upper Cedar River	33	Reach 26 - Roads	Decommission and improve roads	R	R	P
8	Upper Cedar River	33.1	Reach 25 - Roads	Decommission and improve roads	R	R	P

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach mid-point)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
8	Upper Cedar River	All	LWD management	Conduct survey and plan for possible additions as determined necessary and safe	R	R	P
8	Upper Cedar River	All	Reach 24 - Roads	Decommission and improve roads	R	R	P
8	Upper Cedar River	All	Riparian enhancements	Enhance riparian conditions by adding vegetation and ecological thinning	R	R	P
8	Upper Cedar River	All	Road decommissioning and Improvement	Remove and improve roads to reduce sediment	R	R	P

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
8	Upper Rock Creek	1.5	Upper Rock Creek - bridge 41	Reconstruct Bridge 41 to facilitate passage of flood flows and woody debris, if Walsh Lake outlet is diverted back to Rock Creek	R	R	CIP
8	Upper Rock Creek	1.5	Upper Rock creek - restore Walsh Lake Outlet to Upper Rock Creek	Assess effects of diverting Walsh lake outlet flows back into Upper Rock Creek	R	R	CIP
8	Upper Rock Creek	1	Upper Rock Creek - LWD additions	Add LWD as deemed necessary and safe	R	R	P
8	Upper Taylor Creek	0.5	Lower Taylor trestle and bridge	Remove/modify bridge and trestle to reduce channel confinement	R	R	CIP

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8	Upper Taylor Creek	1	Reach 22 - Roads	Decommission and improve roads in Taylor creek	R	R	P
9	Green River	All	KCD Opportunity grant	Allocate grant funds to implement a wide range of small actions to protect and restore aquatic conditions	R	Both	P
9	Green River	All	WRIA 9 Grant Contingency	Contingency fund to take advantage of unforeseen or time-sensitive protection and restoration opportunities	R	R	CIP
9	Green River	All	SHRP Green	Implement small scale restoration programs	R	R	CIP

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9	Green/Duwamish River Estuary	6.3	North Wind's Weir Shallow Water Rehabilitation	Create two acres of off-channel, shallow water habitat in lower Green River fresh-to-marine transition area	R	R	CIP
9	Lower Green River	15.8	Segale #2 & #3	Rehabilitate levees to reduce the risk of flooding in the Lower Green River.	R	R	CIP
9	Lower Green River	20.5	Rosso Nursery off-channel rehabilitation and Riparian Restoration	Create, and connect and restore off-channel habitat	R	R	CIP
9	Lower Green River	21	Schuler Brothers Reach Rehabilitation	Improve 90 acres of habitat to improve water quality and floodplain, riparian and instream conditions	R	R	CIP
9	Lower Green River	21.5	Mullen Slough Mouth Acquisition	Acquire Green River floodplain property for future restoration	R	R	CIP

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9	Lower Green River	16.5	Gunter Levee Setback and Johnson Creek Restoration	Setback Gunter and Frager Road levees and acquire and restore off-channel, floodplain and tributary wetlands	R	R	CIP
9	Lower Green River	22	Lower Mill Creek, Green River Park, Hawley Road Levee, Lower Mullen Slough	Restore access to lower valley tributaries, setbacks levees along Hawley and Frager Roads and restore channel edge and floodplain habitat.	R	R	CIP
9	Lower Green River	24.7	78th Avenue South	Acquire floodplain properties, relocate roadway/revetment system landward, and restore river edge, bank, and floodplain habitat	R	R	CIP
9	Lower Green River	25.6	Northeast Auburn Creek	Restore tributary access	R	R	CIP

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9	Lower Green River	26	Horsehead Bend	Rehabilitate bank line to create shallow marginal habitat and stabilize eroding banks with native riparian vegetation.	R	R	CIP
9	Middle Green River	N/A	Bass/Beaver Lake	Acquisition of key areas for protection of lake ecology and processes	L	P	CIP
9	Middle Green River	50	Green River Gorge Protection (RM 45 to 55)	Protect 164 acres	R	P	CIP
9	Middle Green River	37.5	Green River Natural Area Additions (RM 35 to 40)	Protect 228 acres contiguous with or near the natural area	R	P	CIP
9	Middle Green River	59	Kanasket Habitat Protection (RM 58 to 60)	Protect 48 acres	R	P	CIP

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9	Middle Green River	34	Lower Green River Valley (RM 32 to 35)	Protect 65 acres of floodplain and tributary habitat	R	P	CIP
9	Middle Green River	45	Flaming Geyser Floodplain and side channel reconnection and restoration	Connect side channel and restore floodplain with LWD, native plants and gravel	R	R	CIP
9	Middle Green River	46	Flaming Geyser	Add gravel to Green River just upstream of Flaming Geyser State Park as Phase 1 of program to add gravel to Green River	R	R	CIP
9	Middle Green River	60	Middle Green Side Channel Restoration at RM 60	Restore a side channel and associated sediment and LWD processes	R	R	CIP

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9	Middle Green River	38	Burns Creek Rehabilitation	Restore habitat with plants, LWD, fencing, invasive plant and fine sediment removal	R	R	CIP
9	Middle Green River	38	Lones Levee	Remove existing levee, replace with smaller setback levee and restore river edge and riparian floodplain conditions	R	R	CIP
9	Middle Green River	58	Brunner Slough (Kanasket North)	Create a new side channel in a floodplain swale	R	R	CIP
9	Middle Green River	40	Side channel reconnection Program	Reconnect side channels between RM 32 and 45	R	R	CIP
9	Middle Green River	34.2	Ray Creek Restoration	Enhance channel and riparian conditions and connectivity	R	R	CIP

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9	Middle Green River	35	Kaech Side Channel Rehabilitation	Reconnect and restore side channel	R	R	CIP
9	Middle Green River	62	Middle Green LWD supplementation Program	Restore LWD to river below Howard Hansen Dam	R	R	P
9	Middle Green River	63	Middle Green Gravel Supplementation Program	Restore gravel to river below river below Howard Hansen dam	R	R	P
9	Middle Green River	37	Turley Levee setback	Setback levee to protect agriculture and restore floodplain	R	R	CIP
9	Middle Green River	38	Lone's Levee Setback	Setback levee and restore floodplain	R	R	CIP
9	Middle Green River	32	Fenster-Pautzke Levee Setback & Floodplain Reconnection	Relocate levees and restore floodplain	R	R	CIP

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9	Middle Green River	35	Horath-Kaech Levee Setback and Floodplain Reconnection	Setback levee to protect agriculture and restore floodplain	R	R	CIP
9	Middle Green River	35	Neely and Porter Levee Setback & Floodplain Reconnection	Setback levee to protect agriculture and restore floodplain	R	R	CIP
9	Middle Green River	36	Hamakami Levee Setback	Setback levee to protect agriculture and restore floodplain	R	R	CIP
9	Middle Green River	All	Middle Green River Acquisitions	Acquire properties as necessary to achieve flood hazard reduction and WRIA-based salmon habitat goals	R	R	P

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9	Newaukum Creek	All	Newaukum Creek Acquisition	Acquire key areas for protection and restoration needs as identified in basin plan (TBD in 2007) and as funds available	R	Both	CIP
9	Newaukum Creek	6	Middle Newaukum Creek (RM 4 to 8.5)	Protect 100 acres of stream front and wetland areas	R	P	CIP
9	Newaukum Creek		Lower Newaukum Creek Protection (RM 0 to 4)	Protect 200 acres of stream frontage	R	P	CIP
9	Newaukum Creek	2	Newaukum Creek Mouth Restoration (0.0 to 4.3)	Place LWD and reconfigure lower reach of creek	R	R	CIP
9	Newaukum Creek	All	Newaukum Feasibility	Assess conditions and public safety and habitat needs in Newaukum Creek Basin	R	R	CIP

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9	Newaukum Creek	All	Other Newaukum Restoration	Design and implement restoration as identified in basin plan (TBD in 2007) and as funds available	R	R	CIP
9	Newaukum Creek	6	Big Springs Creek Relocation	Relocate and restore creek at confluence with Newaukum Creek	R	R	CIP
9	Newaukum Creek	7	Newaukum Creek Restoration (RM 0.0 to 14.3)	Enhance, expand, reconnect wetlands, create and protect vegetated buffers and restore and reconnect off-channel habitats	R	R	P
9	Soos Creek	34	Lower Soos Creek Protection	Protect 44 acres of undeveloped floodplain	R	P	CIP

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9	Soos Creek	34	Soos Creek LWD placement	Add woody debris to channel	R	R	CIP
9	Upper Green River	64	Fish Passage at Howard Hanson Dam	Provide passage into Upper Green River	R	R	CIP
9	Upper Green River	67	Gale and Boundary Creeks Culvert Replacement	Remove culverts to restore passage for fish	R	R	CIP
9	Upper Green River	80	Upper Green Habitat Improvements	Add woody debris for hydraulic and habitat diversity and reconnect side channels (RM 73 to 82)	R	R	CIP
9	Upper Green River	84.1	Sunday Creek Revegation	Restore riparian vegetation under BPA powerlines	R	R	CIP

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9	Vashon	Attachment B – Project NS-17	Functioning Nearshore Habitat Protection	Assess and potentially protect approximately 50 sites along nearshore for protection	M	P	CIP
9	Vashon	All	SHRP Vashon	Implement small scale restoration programs	M	R	P
9	Vashon	Attachment B – Project NS-6	Skeeter Creek Pocket Estuary Restoration	Restore mouth and adjacent shoreline of creek and restore fish passage	M	R	CIP
9	Vashon	Attachment B – Project NS-8	Dillworth and Gorsuch Creeks Pocket Estuaries Restoration	Restore mouth and adjacent shoreline of creeks	M	R	CIP
9	Vashon	Attachment B – Project NS-9	Miletta Fish Passage Improvements	Restore fish passage	M	R	CIP

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9	Vashon	Attachment B – Project NS-14	Raab's Lagoon Acquisition and Restoration	Acquisition and restoration of key areas for protection and restoration of marine ecology and processes	M	P	CIP
9	Vashon	Attachment B – Project NS-9	Tsugwalla Fish Passage Improvements	Restore fish passage	M	R	CIP
9	Vashon	Attachment B – Project NS 17	Lost Lake	Acquisition of key areas for protection of marine ecology and processes	M	P	CIP
9	Vashon	Attachment B – Project NS 17	Inspiration Point	Acquisition of key areas for protection of marine ecology and processes	M	P	CIP
9	Vashon	Attachment B – Project NS-9	Camp Sealth Fish Passage Improvements	Restore fish passage	M	R	CIP

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9	Vashon	Attachment B – Project NS-9	Bates Fish Passage Improvements	Restore fish passage	M	R	CIP
9	Vashon	Attachment B – Project NS-7	Cove Creek Pocket Estuary Restoration	Restore mouth and adjacent shoreline of creek	M	R	CIP
9	Vashon	Attachment B – Project NS-9	Ellisport Creek Soil Remediation	Remove soil contaminated with oil	M	R	CIP
9	Vashon	Attachment B – Project NS-9	Ellisport Fish Passage Improvements	Restore fish passage	M	R	CIP
9	Vashon	Attachment B – Project NS-10	Ellis Creek Estuary acquisition and restoration	Acquisition of key areas, removal of dirt road and restoration of tidal processes and connectivity with marine shoreline	M	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach midpoint)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
9	Vashon	Attachment B – Project NS-17	Piner Point W.	Acquisition of key areas for protection of marine ecology and processes	M	P	CIP
9	Vashon	Attachment B – Project NS-17	Dockton Ext. & N	Acquisition of key areas for protection of marine ecology and processes	M	P	CIP
9	Vashon	Attachment B – Project NS17	Piner Point	Acquisition of key areas for protection of marine ecology and processes	M	P	CIP
9	Vashon	Attachment B – Project NS-17	Maury Island Marine Park E. Acquisition	Acquisition of key areas for protection of marine ecology and processes	M	P	CIP
10	Boise Creek	0.25	Boise Creek Restoration	Relocate and restore channel in historic location	R	R	CIP

WRIA	Affected Shoreline	Approximate Location by RM (may be a reach mid-point)	Action	Description	Shoreline type (Marine = M, River = R, Lakes = L)	Primary Environmental Purpose/Effect (Protection = P, Restoration = R)	Type of action (program = P, project =CIP)
10	Red Creek	0.25	Red Creek Acquisitions	Acquire floodprone properties and restore floodplain	R	R	CIP
10	White River	All	White-Greenwater Acquisition	Acquire and remove at-risk structures, remove a concrete flood wall and restore floodplain	R	R	CIP

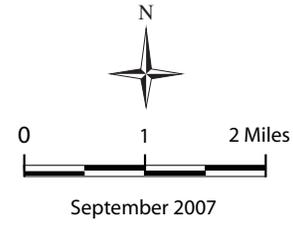
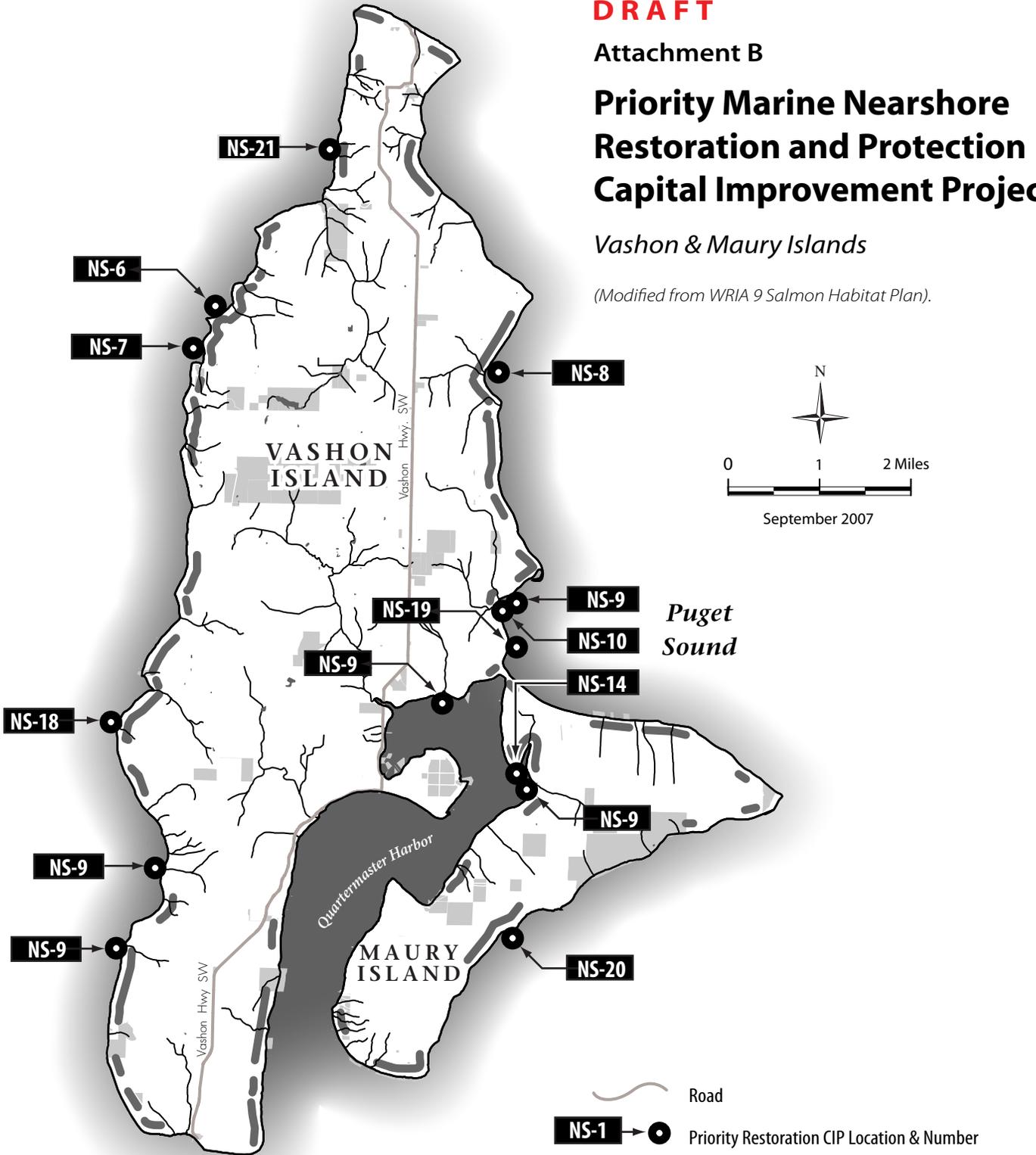
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Attachment B

Priority Marine Nearshore Restoration and Protection Capital Improvement Projects

Vashon & Maury Islands

(Modified from WRIA 9 Salmon Habitat Plan).



- Road
- NS-1** Priority Restoration CIP Location & Number
- Priority Habitat Protection CIP Location **NS-17**
- Publicly-owned and Managed Lands
- Water body

Note:
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