

# Executive Summary

## ES.1 INTRODUCTION AND PURPOSE

The 2006 Draft Key Peninsula-Islands Basin Plan (KI Basin Plan) is a comprehensive guide to surface water management in the Key Peninsula-Islands Basin. The plan focuses on multiple aspects of surface water management, including water quality, flooding, and habitat issues. This plan was developed as part of Pierce County's Basin Planning Program to create a more focused approach to watershed management in each of the County's major drainage basins.

Previously, the Pierce County Storm Drainage and Surface Water Management Plan (1991 Plan) guided surface water management throughout the county. The plan addressed flooding concerns, as those were the issues at the time, for all basins in the County. Water quality and wildlife habitat issues were not included as part of the analysis nor in the recommendations for improvements. The 1991 Plan was used as a source of information on pertinent studies, plans, and regulatory mechanisms related to water resources in the KI Basin. The Key Peninsula-Islands Basin is one of 26 Pierce County basins.

The purpose of the Draft Key Peninsula-Islands Basin Plan is to ensure that limited financial and staff resources are applied to the best capital facility projects and programs. To that end, the Basin Plan strategically identifies and evaluates surface water management issues in the Basin and recommends a comprehensive suite of projects and programs to reduce flood hazards and improve water quality and habitat in the Basin. The KI Basin Plan assumes implementation over a ten-plus year period and will guide annually updated work plans for capital improvement projects and programmatic measures. Programmatic measures are non-structural measures, such as changes to regulations, policies, programs, or operations.

The Basin Plan supports (or furthers) Pierce County's:

- Compliance with its federal Clean Water Act National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit;
- Compliance with the Endangered Species Act (ESA) by reducing fish and wildlife habitat degradation that could jeopardize the continued existence of protected species;
- Upgrade to a Class 4 Community Rating under the Federal Emergency Management Agency's (FEMA) Community Rating System (CRS);
- Hazard Mitigation Planning, as required by FEMA (as a result of congressional action) to retain eligibility for federal disaster relief funds; and
- Submittal to the Washington Department of Fish and Wildlife (WDFW) for a programmatic approval agreement under RCW 77.55.100. This enables WDFW to approve an entire program allowing Pierce County Water Programs to proceed with implementation of projects without the necessity of acquiring a permit for each individual project.

## ES.2 GOALS OF THE DRAFT KEY PENINSULA-ISLANDS BASIN PLAN

Specific goals and objectives of the Draft Key Peninsula-Islands Basin Plan are:

### **Reduce flood hazards**

- Incidents of property loss and repeat damage are reduced.
- Streams are not adversely impacted by flood events.
- Pierce County's standing under the Federal Emergency Management Agency Community Rating System is improved.
- New development is located outside of flood prone areas.

### **Improve fish and wildlife habitat**

- Number of stream miles available for wild, native fish populations is increased.
- Population numbers of species listed as endangered or threatened under the Federal Endangered Species Act (ESA) are maintained or increased.
- Quality and quantity of available wetland, riparian, and upland habitat is improved.

### **Improve water quality**

- State Surface Water Quality Standards (WAC 173-201a) are met or exceeded.
- Potential for impaired (303d listed) water bodies is reduced.
- Pierce County is in compliance with its NPDES permit for stormwater by meeting permit terms and conditions.
- All commercial and recreational shellfish beds meet Department of Health water quality criteria for harvest.
- Risk of groundwater contamination is reduced.
- Rates of erosion are reduced.

### **Coordinated and responsible use of public resources**

- Cost of maintaining stormwater facilities is reduced.
- Project value is favorable when measured against costs and benefits.

- Polls demonstrate that public awareness of flooding, habitat, and water quality issues has increased.
- Monitoring and enforcement programs demonstrate an increase in services per dollar spent.
- Basin plan implementation also implements elements of other Pierce County plans.
- Basin plan development and implementation include soliciting and incorporating input from other departments and agencies.

### **Influence location and methods for new development**

- New development in flood prone, riparian, or significant habitat areas is prohibited.
- Low Impact Development techniques are widely used.
- Effective BMPs are identified and widely used.

## **ES.3 DESCRIPTION OF BASIN**

The Key Peninsula-Islands Basin is an agglomeration of four separate surface water drainage basins identified by Pierce County Water Programs. These are the Key Peninsula Basin (#10), the Islands Basin (#17), the Burley–Minter Basin (#25), and the Fox Island Basin (#26). Combined, these basins have an area of approximately 114 square miles.

The Key Peninsula extends southward into Puget Sound and is bounded on the west by Case Inlet and on the east by Carr Inlet. Islands surrounding the Key Peninsula are also included in the Basin and include: Fox, Raft, Cutts, Ketron, Anderson, and Herron Islands. McNeil Island and a small area of Mason County are not included in this plan. Several drainages located along the Pierce/Kitsap County line form the northern boundary of the KI Basin.

Much of the peninsula consists of rolling, rather flat-topped hills and ridges. Bluffs drop to the waters of Puget Sound on all three sides of the peninsula and on the islands. There are approximately 57 streams in the Basin. The climate of the KI Basin is mild. It receives between 50 and 55 inches of precipitation annually, including approximately 5 inches of snow on average.

In the year 2000, the KI Basin had 20,900 residents. The population is expected to grow to 24,400 by 2020. The KI Basin lies largely within unincorporated Pierce County except for the area at the northern edge that lies within unincorporated Kitsap County.

## ES.4 STAKEHOLDER AND PUBLIC INVOLVEMENT

Two public meetings were held in 2003 to describe the Basin planning process and to solicit information at the beginning of Phase 1. Two additional public meetings were held at the end of Phase 1, in 2004, to describe the findings. One of these meetings was with the Anderson Island Homeowner's Association. In addition to these meetings, letters and surveys were sent to approximately 500 streamside property owners. Regular updates on the progress of the plan have been provided at monthly meetings of the Key Peninsula-Gig Harbor-Islands Watershed Council.

Additional stakeholder and public involvement opportunities will be provided when the Draft Key Peninsula-Islands Basin Plan is distributed for public review. The stakeholder mailing list developed in Phase 1 will be used to publish a Notice of Availability, as well as provide notice about public meetings. One public meeting will be held in cooperation with the Key Peninsula-Gig Harbor-Islands Watershed Council and one public meeting will be held separately. Additionally, the plan will be presented at public meetings of the Pierce County Storm Drainage and Surface Water Management Advisory Board (SWAB), the Pierce County Planning Commission, appropriate committees of the Pierce County Council, and to the Pierce County Council as a whole before it is adopted. All of these meetings will provide opportunities for public comment.

## ES.5 PROBLEMS, PROPOSED SOLUTIONS AND PRIORITIZATION PROCESS

Four types of interrelated problems were identified in this study:

- Only minor flooding has occurred in the basin in the past. While some roadway culverts do not meet current flood protection standards, flooding is not expected to greatly increase because the basin should remain largely rural.
- Water quality in streams appears to be generally good but with some significant impairments. Bacteriological water quality in most streams does not comply with state standards. Elevated bacterial levels in streams may be contributing to the contamination of shellfish beds that are located near the point of discharge of streams to Puget Sound. Some streams exhibit depressed dissolved oxygen levels which may be harmful to aquatic life.
- Streamside fish habitat and wildlife is in relatively good condition with 44% of instream aquatic habitat and 72% of the riparian corridor receiving "Good" ratings. Access to streams for migratory fish is impaired with 34 culverts identified as full fish passage barriers, blocking upstream passage to instream habitat in the Key Peninsula-Islands Basin. An additional 12 culverts have been identified as potential fish passage barriers, requiring further evaluation.

- Finally, it is apparent that some land use practices, such as agricultural activities and residential landscaping, cause impairment of healthy riparian corridors and aquatic habitat through excessive erosion and fecal coliform contributions to the streams.

Each of the potential capital improvement projects and programmatic recommendations were evaluated for their net natural resource management benefit and then prioritized based on cost-to-benefit considerations.

In determining net benefit, each project and program was scored using an instrument that assigned points for the project/program's potential for various aspects of flood reduction (approximately 35% of total), water quality protection or improvement (approximately 30% of total), natural resource improvement (approximately 30% of total), and other factors such as multiple use, education, and recreation (approximately 5% of total). Each project and program was reviewed and scored using approximately 40 specific criteria.

A scoring worksheet was prepared for each proposed project. These worksheets are included in *Appendices G and H* of the basin plan.

Recommended projects and programs were then put in rank order, based on their numeric benefit score, and grouped in descending order. Then, high, medium, or low status was assigned as follows:

- High-Priority: 25% of total number of recommendations
- Medium-Priority: 50% of total number of recommendations
- Low-Priority<sup>1</sup>: 25% of total number of recommendations

After this order was established, projects and programs were ranked within their priority category from lowest cost to highest cost. This was done to direct County financial resources to where they do the most good for the financial resources invested.

## ES.6 RECOMMENDED ACTIONS

The Key Peninsula Island Basin Plan identifies and recommends capital improvement projects and programmatic actions. These actions are summarized in the projects and programs prioritized for benefit and ranked by cost table. In the table, columns provide project identification numbers, project description, lifecycle (10-year) costs, total benefit priority score, and relative priority (High, Medium, and Low).

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<sup>1</sup> Note: "low priority" does not mean "no benefit" for flood control, water quality protection, or natural resource protection. All of the recommendations in the Basin Plan provide a net benefit to these objectives. "No benefit" proposals were screened out prior to preparation of the Plan. "Low Priority" means that the proposed project or program scored lower than other projects and programs, based on the net environmental benefits that would occur from the project or program as determined by the score sheet criteria. Some projects that are ranked "medium priority" or "low priority" will be considered for implementation prior to other projects to ensure the full benefits of other projects, such as upstream fish habitat improvements are synchronized with downstream barrier removal.

Actions recommended in the plan total \$34,486,000 over a ten year period. Of that amount:

- \$19,026,000 is for actions identified as High-Priority;
- \$12,777,000 is for actions identified as Medium-Priority;
- \$ 2,683,000 is for actions identified as Low-Priority;

Of the total estimated basin plan cost, \$26,914,500 is for capital improvement projects and \$7,571,500 is for programmatic additions.

Eighty capital improvement projects are recommended in the Basin Plan. These include a variety of culvert replacements for improved fish passage and reduced flood hazards; implementation of bank stabilization measures; improvements to aquatic habitat; improvements to riparian corridors; and stream-side property acquisitions for protection and improvement of riparian corridors and aquatic habitat. Stream-side restoration and land acquisition recommendations far exceed the amount of culvert replacement recommendation.

This reflects the rural nature of the Basin and that the most effective use of limited resources is to focus on preserving existing good water quality and fish and wildlife habitat and preventing future roadway and structure flooding by:

- A total of \$9,242,000 are for stream enhancements and wetland restoration, and
- A total of \$3,477,500 of the recommendations is for culvert replacements and fish passage projects, and
- A total of \$14,195,000 is for land acquisition.

Programmatic measures recommended in the Key Peninsula-Islands Basin Plan include:

- PG-01 Implement Low Impact Development Program
- PG-02 Increase Inspections for Compliance with Stormwater Requirements and NPDES Permit
- PG-03 Develop & Implement a Land Management Program
- PG-04 Develop & Implement Program to Enhance Degraded Riparian Habitat & Water Quality
- PG-05 Develop & Implement an Education, Outreach & Technical Assistance Program
- PG-06 Develop & Implement Surface Water Quality Monitoring Program
- PG-07 Develop & Implement Stormwater Education Program for Shoreline Property Owners
- PG-08 Develop & Implement BMP Manual for Water Programs Maintenance Activities
- PG-09 Provide Technical Assistance to Nonprofit Groups Installing Fish-Friendly Culverts

- PG-10 Develop & Implement Habitat Monitoring Program
- PG-11 Encourage Installation of Permanent Buffer Markings and/or Signage
- PG-12 Establish a Wetlands Banking or Advanced Mitigation Program
- PG-13 Develop & Implement an Invasive Species Management Program
- PG-14 Implement Elements of Shellfish Protection Program

## ES.7 IMPLEMENTATION STRATEGY

Implementation of the recommended actions will generally follow the prioritization groupings of high, medium, and low and a logical order of sequencing. To ensure that the full benefits of all projects are realized, implementation will not follow the exact sequence of the first project to the last project in the high category, followed by the first action in the medium category, and so forth. Several factors exist that will result in implementation of actions that are not in the exact sequence as depicted in *Table S-1*. These factors include the following:

- Available funds;
- Contingent projects<sup>2</sup>;
- Available staff and professional service needs;
- Cooperation from private landowners;
- The best implementer may be an agency other than Pierce County Public Works and Utilities; and
- New information, regulations or emerging issues.

Contingent projects include projects such as stream restoration projects intended to reduce flood hazards and improve aquatic habitat, and culvert replacement projects intended to improve fish passage. These projects will provide their full benefit after all downstream fish passage barriers and flood hazards are removed, and should be sequenced accordingly.

In light of these and other factors, following action on the Basin Plan, Pierce County will develop an implementation strategy designed to sequence, schedule and assign resources for the various recommended actions. This implementation strategy will be developed in collaboration and coordination with other potential implementers and in consideration with available financial

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<sup>2</sup> Contingent projects include projects such as stream restoration projects intended to reduce flood hazards and improve aquatic habitat, and culvert replacement projects intended to improve fish passage. These projects will provide their full benefit after all downstream fish passage barriers are removed, and should be sequenced accordingly.

and staff resources. The implementation strategy will include performance measurements and provide for periodic evaluation of progress.

### **ES.7.1 Economic Development Criteria**

Implementing projects and programs recommended in the Basin Plan is expected to reduce flood hazards, and preserve or protect water quality and floodplain habitat. Collectively and individually, these projects are aimed at protecting Pierce County's quality of life.

Projects and programs in the Plan will afford resource protection as the community develops; preserve, enhance or protect natural floodplain functions; balance structural and nonstructural approaches; reduce potential County environmental liabilities; and help achieve environmental compliance and long-term sustainability.

Collectively, these attributes help make Pierce County a liveable community where quality of life issues will provide indirect, passive economic development benefits to businesses and individuals looking to locate or stay in Pierce County.

In addition to the above, Water Programs will consider the following criteria in developing its annual proposed capital facilities plan updates:

- Is the project located in an employment center zone (or handle flow from those zones)?
- Is the project located in another type of commercial zone (or handle flow from those zones)?
- Will the project reduce permitting timelines for industrial/commercial projects?
- Will the project assure access to an employment center via road and /or rail?
- Will the project increase the supply of developable property?
- Will the project reduce overall development costs?
- Are there partners willing to contribute to the development costs of the project?
- Does the project allow/provide for land development?

**Table ES-1:  
All Projects in KPI Basin Plan Sorted by Priority and Cost**

Row #	Priority	Subbasin	Number/Code	Type	Location/Name	Estimated Cost (\$)	Score
1	High	Basin-wide	PG-13	Programmatic	Invasive Species	\$ 7,000	285
2	High	Basin-wide	PG-09	Programmatic	Tech Assistance	\$ 8,700	294
3	High	Basin-wide	PG-03	Programmatic	Land Management	\$ 9,570	407
4	High	Basin-wide	PG-04	Programmatic	Restoration Program	\$ 34,500	310
5	High	Basin-wide	PG-12	Programmatic	Wetlands Banking	\$ 50,000	414
6	High	Basin-wide	PG-08	Programmatic	BMP Manual	\$ 71,000	426
7	High	Basin-wide	PG-01	Programmatic	LID	\$ 100,000	351
8	High	Basin-wide	PG-05	Programmatic	Education & Outreach	\$ 104,000	388
9	High	Basin-wide	PG-02	Programmatic	Inspections	\$ 208,800	403
10	High	Vaughn Creek	VA-AC03	Land Acquisition	Reach VA03	\$ 289,256	260
11	High	Rocky Creek	RC-AC06	Land Acquisition	Reach RC06	\$ 289,256	265
12	High	Huge Creek	HG-AC03	Land Acquisition	Reach HG03	\$ 413,223	265
13	High	Rocky Creek	RC-AC01	Land Acquisition	Reach RC01	\$ 590,909	265
14	High	Basin-wide	PG-07	Programmatic	Shoreline Education	\$ 600,000	281
15	High	East Fork Rocky	EF-AC04	Land Acquisition	Reach EF04	\$ 600,000	265
16	High	Vaughn Creek	VA-AC05	Land Acquisition	Reach VA05	\$ 619,835	270
17	High	East Fork Rocky	EF-RST04	Stream Restoration	Reach EF04	\$ 630,000	270
18	High	Purdy Creek	PR-CR02	Culvert Replacement	144th	\$ 718,272	280
19	High	Huge Creek	HG-AC01	Land Acquisition	Reach HG01	\$ 1,006,198	285
20	High	Huge Creek	HG-AC02	Land Acquisition	Reach HG02	\$ 1,165,289	280
21	High	Rocky Creek	RC-AC04	Land Acquisition	Reach RC04	\$ 1,561,983	275
22	High	Rocky Creek	RC-AC03	Land Acquisition	Reach RC03	\$ 1,733,471	260
23	High	Rocky Creek	RC-AC02	Land Acquisition	Reach RC02	\$ 2,014,463	260
24	High	Basin-wide	PG-14	Programmatic	Shellfish Protection	\$ 6,200,000	368
<b>Total High Priority Projects</b>						<b>\$ 19,025,726</b>	
25	Medium	Basin-wide	PG-10	Programmatic	Habitat Monitoring	\$ 7,750	194
26	Medium	Basin-wide	PG-11	Programmatic	Buffer Signs	\$ 7,750	193
27	Medium	Dutcher Creek	DU-CR06	Culvert Replacement	70th Street	\$ 18,672	140
28	Medium	Rocky West	RW-CR01	Culvert Replacement	144th St.	\$ 32,951	145
29	Medium	Schoolhouse Ck.	AI-CR03	Culvert Replacement	Oro Bay Road	\$ 35,070	240
30	Medium	Minter Creek	MN-RST11	Stream Restoration	Reach MN11	\$ 40,000	150
31	Medium	Schoolhouse Ck.	AI-CR02	Culvert Replacement	Eckenstam Johnson Road,	\$ 43,837	235
32	Medium	Vaughn Creek	VB-CR02	Culvert Replacement	South Vaughn Rd.	\$ 58,482	165
33	Medium	Purdy Creek	PR-RST01	Stream Restoration	Reach PR01	\$ 60,000	255

**Table ES-1:  
All Projects in KPI Basin Plan Sorted by Priority and Cost**

<b>Row #</b>	<b>Priority</b>	<b>Subbasin</b>	<b>Number/Code</b>	<b>Type</b>	<b>Location/Name</b>	<b>Estimated Cost (\$)</b>	<b>Score</b>
34	Medium	Huge Creek	HG-CR06	Culvert Replacement	160th St.	\$ 60,837	160
35	Medium	Purdy Creek	PR-CR07	Culvert Replacement	160th St.	\$ 66,198	130
36	Medium	Dutcher Creek	DU-FP01	Fish Passage	Lackey Road	\$ 81,000	140
37	Medium	Schoolhouse KPI	SC-RST03	Stream Restoration	Reach SC03	\$ 110,000	165
38	Medium	Whiteman Crk.	WH-RST01	Stream Restoration	Reach WH01	\$ 119,000	170
39	Medium	Whiteman Creek	WH-CRNS1	Culvert Replacement	Bay Road	\$ 125,518	145
40	Medium	Whiteman Creek	WH-CRNS2	Culvert Replacement	Bay Road	\$ 125,518	145
41	Medium	Purdy Creek	PR-RST02	Stream Restoration	Reach PR02	\$ 128,000	230
42	Medium	Schoolhouse AI	AI-RST04	Stream Restoration	Reach AI04	\$ 128,000	130
43	Medium	Purdy Creek	PR-RST05	Stream Restoration	Reach PR05	\$ 138,000	185
44	Medium	Minter Creek	MN-RST08	Stream Restoration	Reach MN08	\$ 140,600	150
45	Medium	Dutcher Creek	DU-CR04	Culvert Replacement	Lackey Road	\$ 142,158	155
46	Medium	Vaughn Creek	VA-CR04	Culvert Replacement	McFadden Rd.	\$ 146,163	165
47	Medium	Little Minter	LM-RST08	Stream Restoration	Reach LM08	\$ 150,000	150
48	Medium	Purdy Creek	PR-RST07	Stream Restoration	Reach PR07	\$ 154,000	185
49	Medium	Amsterdam Bay	AIT-CR01	Culvert Replacement	Sandberg Rd.	\$ 154,554	150
50	Medium	Basin-wide	PG-06	Programmatic	WQ Monitoring	\$ 162,000	154
51	Medium	Rocky West	RW-RST02	Stream Restoration	Reach RW02	\$ 168,000	190
52	Medium	Schoolhouse Ck.	AI-CR08	Culvert Replacement	Eckenstam Johnson Road	\$ 190,452	135
53	Medium	Minter Creek	MN-RST05	Stream Restoration	Reach MN05	\$ 200,000	170
54	Medium	Home Creek	HM-RST01	Stream Restoration	Reach HM01	\$ 200,000	130
55	Medium	Minter Creek	MN-RST07	Stream Restoration	Reach MN07	\$ 205,400	190
56	Medium	Vaughn Creek	VA-WTRST04	Wetland Restoration	Reach VA04	\$ 230,000	225
57	Medium	Whiteman Crk.	WH-WTRST01	Wetland Restoration	Reach WH01	\$ 273,700	220
58	Medium	Schoolhouse AI	AI-WTRST04	Wetland Restoration	Reach AI04	\$ 294,400	225
59	Medium	Huge Creek	HG-AC04	Land Acquisition	Reach HG04	\$ 363,636	255
60	Medium	Taylor Bay	TB-RST01	Stream Restoration	Reach TB01	\$ 420,000	165
61	Medium	Herron Lake	HL-RST01	Stream Restoration	Reach HL01	\$ 420,000	135
62	Medium	Purdy Creek	PR-RST06	Stream Restoration	Reach PR06	\$ 428,000	180
63	Medium	Vaughn Creek	VA-RST02	Stream Restoration	Reach VA02	\$ 440,000	175
64	Medium	Little Minter	LM-RST02	Stream Restoration	Reach LM02	\$ 448,000	185
65	Medium	Minter Creek	MN-RST01	Stream Restoration	Reach MN01	\$ 480,000	185
66	Medium	Huge Creek	HG-RST01	Stream Restoration	Reach HG01	\$ 487,000	225
67	Medium	East Fork Rocky	EF-AC02	Land Acquisition	Reach EF02	\$ 516,529	255
68	Medium	East Fork Rocky	EF-AC03	Land Acquisition	Reach EF03	\$ 626,033	245

**Table ES-1:  
All Projects in KPI Basin Plan Sorted by Priority and Cost**

<b>Row #</b>	<b>Priority</b>	<b>Subbasin</b>	<b>Number/Code</b>	<b>Type</b>	<b>Location/Name</b>	<b>Estimated Cost (\$)</b>	<b>Score</b>
69	Medium	East Fork Rocky	EF-AC01	Land Acquisition	Reach EF01	\$ 710,744	255
70	Medium	Little Minter	LM-RST01	Stream Restoration	Reach LM01	\$ 744,000	190
71	Medium	Rocky Creek	RC-AC07	Land Acquisition	Reach RC07	\$ 826,446	260
72	Medium	Rocky Creek	RC-AC05	Land Acquisition	Reach RC05	\$ 867,769	260
73	Medium	Minter Creek	MN-RST09	Stream Restoration	Reach MN9	\$ 1,160,000	180
<b>Total Medium Priority Projects</b>						<b>\$ 13,136,167</b>	
74	Low	Schoolhouse Ck.	AI-CR09	Culvert Replacement	Logging Rd. N. of 108th	\$ 5,000	90
75	Low	Dutcher Creek	DU-CR05	Culvert Replacement	68th Street	\$ 5,000	65
76	Low	Knackstedt Creek	HE-CR01	Culvert Replacement	21st Avenue	\$ 52,099	120
77	Low	Devil's Head	DHT-CR01	Culvert Replacement	88th Street	\$ 54,369	80
78	Low	Schoolhouse KP	SCT-CR02	Culvert Replacement	Mahnke Rd., Filucy Bay	\$ 54,822	90
79	Low	Vaughn Creek	VA-RST01	Stream Restoration	Reach VA01	\$ 60,000	125
80	Low	Glen Cove	GCT-CR02	Culvert Replacement	Thomas Rd.	\$ 69,336	70
81	Low	Glen Cove	GCT-CR01	Culvert Replacement	Thomas Rd.	\$ 81,672	70
82	Low	Filucy Bay	FBT-CR02	Culvert Replacement	South of 56th St	\$ 82,377	125
83	Low	Purdy Creek	PR-CR04	Culvert Replacement	62nd Avenue	\$ 85,108	120
84	Low	Filucy Bay	FBT-CR01	Culvert Replacement	Erickson Rd.	\$ 91,692	115
85	Low	Schoolhouse Ck.	SC-CR01	Culvert Replacement	East of KP Hwy, west of	\$ 98,825	110
86	Low	Vaughn Creek	VA-RST04	Stream Restoration	Reach VA04	\$ 100,000	120
87	Low	Huge Creek	HG-RST05	Stream Restoration	Reach HG05	\$ 106,000	95
88	Low	Whiteman Creek	WH-CR02	Culvert Replacement	Whiteman Cove Road	\$ 119,188	70
89	Low	Home Creek	HM-RST02	Stream Restoration	Reach UC01	\$ 120,000	120
90	Low	Schoolhouse KP	SCT-CR01	Culvert Replacement	Mahnke Rd., Filucy Bay	\$ 122,974	95
91	Low	Rocky Creek	RC-CR03	Culvert Replacement	144th St.	\$ 143,388	120
92	Low	Herron Lake Creek	HL-FP01	Fish Passage	Mouth of creek	\$ 150,000	70
93	Low	Vaughn Creek	VAT-FP02	Fish Passage	Wright-Bliss Rd.	\$ 150,000	70
94	Low	Whiteman Creek	WH-CR03	Culvert Replacement	Whiteman Road	\$ 154,200	100
95	Low	Huge Creek	HG-RST06	Stream Restoration	Reach HG06	\$ 190,000	105
96	Low	Little Minter	LM-RST03	Stream Restoration	Reach LM03	\$ 270,000	115
97	Low	Vaughn Creek	VAT-CR01	Culvert Replacement	Hall Rd.	\$ 316,755	105
<b>Total Low Priority Projects</b>						<b>\$ 2,682,805</b>	
<b>Total - All Projects</b>						<b>\$ 34,844,698</b>	

**Table ES-2:  
Key Peninsula Islands Basin Plan CIPs Grouped by Stream**

Priority	Score	Subbasin	CIP name	CIP	Location	Estimated Cost (\$)	Reach Subtotal
<b>DEVIL'S HEAD</b>							
Low	80	Devil's Head	DHT-CR01	Culvert Replacement	88th Street	\$ 54,369	\$ 54,369
<b>Stream Average Priority</b>	<b>80</b>	<b>Devil's Head Total</b>					<b>\$ 54,369</b>
<b>DUTCHER CREEK</b>							
Medium	140	Dutcher Creek	DU-FP01	Fish Passage Project	West of Lackey Road	\$ 81,000	\$ 81,000
Medium	155	Dutcher Creek	DU-CR04	Culvert Replacement	Lackey Road	\$ 142,158	\$ 142,158
Low	65	Dutcher Creek	DU-CR05	Culvert Replacement	68th Street	\$ 5,000	\$ 5,000
Medium	140	Dutcher Creek	DU-CR06	Culvert Replacement	70th Avenue	\$ 18,672	\$ 18,672
<b>Stream Average Priority</b>	<b>125</b>	<b>Dutcher Creek Total</b>					<b>\$ 246,830</b>
<b>EAST FORK ROCKY CREEK</b>							
Medium	255	East Fork Rocky	EF-AC01	Land Acquisition	Reach EF01	\$ 710,744	\$ 710,744
Medium	255	East Fork Rocky	EF-AC02	Land Acquisition	Reach EF02	\$ 516,529	\$ 516,529
Medium	245	East Fork Rocky	EF-AC03	Land Acquisition	Reach EF03	\$ 626,033	\$ 626,033
High	270	East Fork Rocky	EF-RST04	Stream Restoration	Reach EF04	\$ 630,000	
High	265	East Fork Rocky	EF-AC04	Land Acquisition	Reach EF04	\$ 600,000	\$ 1,230,000
<b>Stream Average Priority</b>	<b>258</b>	<b>East Fork Rocky Total</b>					<b>\$ 3,083,306</b>
<b>FILUCY BAY</b>							
Low	115	Filucy Bay	FBT-CR01	Culvert Replacement	Erickson Road	\$ 91,692	\$ 91,692
Low	125	Filucy Bay	FBT-CR02	Culvert Replacement	South of 56th St.	\$ 82,377	\$ 82,377
<b>Stream Average Priority</b>	<b>120</b>	<b>Filucy Bay</b>					<b>\$ 174,069</b>

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Key Peninsula Islands Basin Plan CIPs Grouped by Stream**

<b>Priority</b>	<b>Score</b>	<b>Subbasin</b>	<b>CIP name</b>	<b>CIP</b>	<b>Location</b>	<b>Estimated Cost (\$)</b>	<b>Reach Subtotal</b>
<b>GLEN COVE</b>							
Low	70	Glen Cove	GCT-CR01	Culvert Restoration	Thomas Road	\$ 81,672	\$ 81,672
Low	70	Glen Cove	GCT-CR02	Culvert Restoration	Thomas Road	\$ 69,336	\$ 69,336
<b>Stream Average Priority</b>	<b>70</b>						<b>\$ 151,008</b>
<b>HERRON LAKE CREEK</b>							
Medium	135	Herron Lake	HL-RST01	Stream Restoration	Reach HL01	\$ 420,000	\$ 420,000
Low	70	Herron Lake	HL-FP01	Fish Passage Project	Mouth of Herron Lake Cr.	\$ 150,000	\$ 150,000
<b>Stream Average Priority</b>	<b>103</b>	<b>Herron Lake Total</b>					<b>\$ 570,000</b>
<b>HOME CREEK</b>							
Medium	130	Home Creek	HM-RST01	Stream Restoration	Reach HM01	\$ 200,000	\$ 200,000
Low	120	Home Creek	HM-RST02	Stream Restoration	Creek #150043	\$ 120,000	\$ 120,000
<b>Stream Average Priority</b>	<b>125</b>	<b>Home Creek Total</b>					<b>\$ 320,000</b>
<b>HUGE CREEK</b>							
High	285	Huge Creek	HG-AC01	Land Acquisition	Reach HG01	\$ 1,006,198	
Medium	225	Huge Creek	HG-RST01	Stream Restoration	Reach HG01	\$ 487,000	\$ 1,493,198
High	280	Huge Creek	HG-AC02	Land Acquisition	Reach HG02	\$ 1,165,289	\$ 1,165,289
High	265	Huge Creek	HG-AC03	Land Acquisition	Reach HG03	\$ 413,223	\$ 413,223
Medium	255	Huge Creek	HG-AC04	Land Acquisition	Reach HG04	\$ 363,636	\$ 363,636
Low	95	Huge Creek	HG-RST05	Stream Restoration	Reach HG05	\$ 106,000	\$ 106,000
Medium	160	Huge Creek	HG-CR06	Culvert Replacement	160th St.	\$ 60,837	
Low	105	Huge Creek	HG-RST06	Stream Restoration	Reach HG06	\$ 190,000	\$ 250,837
<b>Stream Average Priority</b>	<b>209</b>	<b>Huge Creek Total</b>					<b>\$ 3,792,183</b>

**Table ES-2:  
Key Peninsula Islands Basin Plan CIPs Grouped by Stream**

Priority	Score	Subbasin	CIP name	CIP	Location	Estimated Cost (\$)	Reach Subtotal
<b>KNACKSTEDT CREEK</b>							
Low	120	Knackstedt Creek	HE-CR01	Culvert Replacement	21St. Avenue	\$ 52,099	\$ 52,099
<b>Stream Average Priority</b>	<b>120</b>	<b>Knackstedt Creek Total</b>					<b>\$ 52,099</b>
<b>LITTLE MINTER CREEK</b>							
Medium	190	Little Minter	LM-RST01	Stream Restoration	Reach LM01	\$ 744,000	\$ 744,000
Medium	185	Little Minter	LM-RST02	Stream Restoration	Reach LM02	\$ 448,000	\$ 448,000
Low	115	Little Minter	LM-RST03	Stream Restoration	Reach LM03	\$ 270,000	\$ 270,000
Medium	150	Little Minter	LM-RST08	Stream Restoration	Reach LM08	\$ 150,000	\$ 150,000
<b>Stream Average Priority</b>	<b>160</b>	<b>Little Minter Creek Total</b>					<b>\$ 1,612,000</b>
<b>MINTER CREEK</b>							
Medium	185	Minter Creek	MN-RST01	Stream Restoration	Reach MN01	\$ 480,000	\$ 480,000
Medium	170	Minter Creek	MN-RST05	Stream Restoration	Reach MN05	\$ 200,000	\$ 200,000
Medium	190	Minter Creek	MN-RST07	Stream Restoration	Reach MN07	\$ 205,400	\$ 205,400
Medium	150	Minter Creek	MN-RST08	Stream Restoration	Reach MN08	\$ 140,600	\$ 140,600
Medium	180	Minter Creek	MN-RST09	Stream Restoration	Reach MN09	\$ 1,160,000	\$ 1,160,000
Medium	150	Minter Creek	MN-RST11	Stream Restoration	Reach MN11	\$ 40,000	\$ 40,000
<b>Stream Average Priority</b>	<b>171</b>	<b>Minter Creek Total</b>					<b>\$ 2,226,000</b>

**Table ES-2:  
Key Peninsula Islands Basin Plan CIPs Grouped by Stream**

<b>Priority</b>	<b>Score</b>	<b>Subbasin</b>	<b>CIP name</b>	<b>CIP</b>	<b>Location</b>	<b>Estimated Cost (\$)</b>	<b>Reach Subtotal</b>
<b>PURDY CREEK</b>							
Medium	255	Purdy Creek	PR-RST01	Stream Restoration	Reach PR01	\$ 60,000	\$ 60,000
Medium	230	Purdy Creek	PR-RST02	Stream Restoration	Reach PR02	\$ 128,000	
High	280	Purdy Creek	PR-CR02	Culvert Replacement	144th	\$ 718,272	\$ 846,272
Low	120	Purdy Creek	PR-CR04	Culvert Replacement	62nd Avenue	\$ 85,108	\$ 85,108
Medium	185	Purdy Creek	PR-RST05	Stream Restoration	Reach PR05	\$ 138,000	\$ 138,000
Medium	180	Purdy Creek	PR-RST06	Stream Restoration	Reach PR06	\$ 428,000	\$ 428,000
Medium	185	Purdy Creek	PR-RST07	Stream Restoration	Reach PR07	\$ 154,000	
Medium	130	Purdy Creek	PR-CR07	Culvert Replacement	160th St.	\$ 66,198	\$ 220,198
<b>Stream Average Priority</b>	<b>196</b>	<b>Purdy Creek Total</b>					<b>\$ 1,777,578</b>
<b>ROCKY CREEK</b>							
High	265	Rocky Creek	RC-AC01	Land Acquisition	Reach RC01	\$ 590,909	\$ 590,909
High	260	Rocky Creek	RC-AC02	Land Acquisition	Reach RC02	\$ 2,014,463	\$ 2,014,463
High	260	Rocky Creek	RC-AC03	Land Acquisition	Reach RC03	\$ 1,733,471	
Low	120	Rocky Creek	RC-CR03	Culvert Replacement	144th St.	\$ 143,388	\$ 1,876,859
High	275	Rocky Creek	RC-AC04	Land Acquisition	Reach RC04	\$ 1,561,983	\$ 1,561,983
Medium	260	Rocky Creek	RC-AC05	Land Acquisition	Reach RC05	\$ 867,769	\$ 867,769
High	265	Rocky Creek	RC-AC06	Land Acquisition	Reach RC06	\$ 289,256	\$ 289,256
Medium	260	Rocky Creek	RC-AC07	Land Acquisition	Reach RC07	\$ 826,446	\$ 826,446
<b>Stream Average Priority</b>	<b>246</b>	<b>Rocky Creek Total</b>					<b>\$ 8,027,685</b>
<b>ROCKY WEST CREEK</b>							
Medium	145	Rocky West	RW-CR01	Culvert Replacement	144th St.	\$ 32,951	\$ 32,951
Medium	190	Rocky West	RW-RST02	Stream Restoration	Reach RW02	\$ 168,000	\$ 168,000
<b>Stream Average Priority</b>	<b>168</b>	<b>Rocky West Total</b>					<b>\$ 200,951</b>

**Table ES-2:  
Key Peninsula Islands Basin Plan CIPs Grouped by Stream**

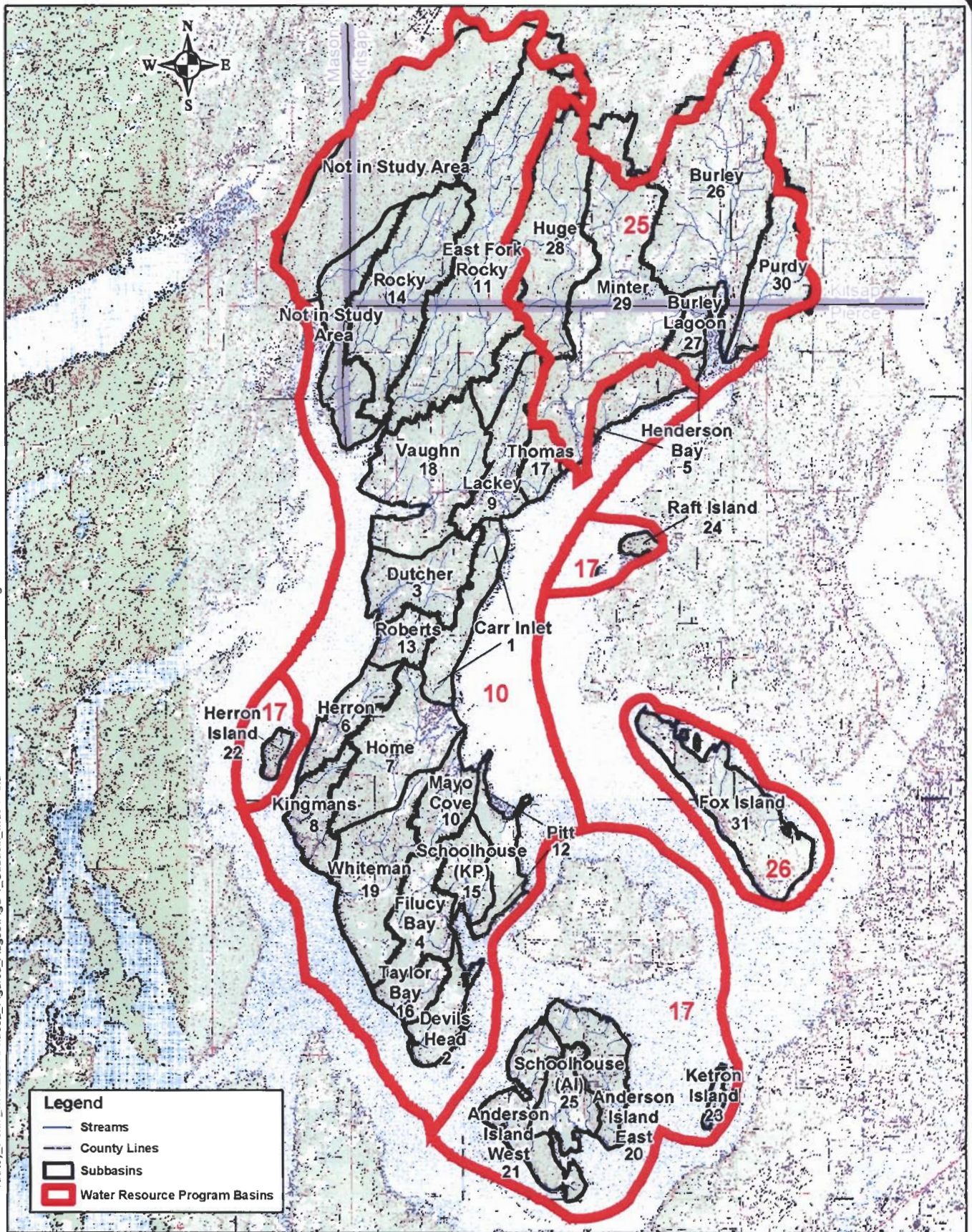
Priority	Score	Subbasin	CIP name	CIP	Location	Estimated Cost (\$)	Reach Subtotal
<b>SCHOOLHOUSE CREEK and AMSTERDAM BAY-ANDERSON ISLAND</b>							
Medium	235	Schoolhouse (AI)	AI-CR02	Culvert Replacement	Eckenstam Johnson Road,	\$ 43,837	\$ 43,837
Medium	240	Schoolhouse (AI)	AI-CR03	Culvert Replacement	Oro Bay Road	\$ 35,070	\$ 35,070
Medium	225	Schoolhouse (AI)	AI-WTRST04	Wetland Restoration	Reach AI04	\$ 294,400	
Medium	130	Schoolhouse (AI)	AI-RST04	Stream Restoration	Reach AI04	\$ 128,000	\$ 422,400
Medium	135	Schoolhouse (AI)	AI-CR08	Culvert Replacement	Eckenstam Johnson Road and 108th St.	\$ 190,452	\$ 190,452
Low	90	Schoolhouse (AI)	AI-CR09	Culvert Replacement	Abandoned logging road north of 108th St.	\$ 5,000	\$ 5,000
Medium	150	Amsterdam Bay	AIT-CR01	Culvert Replacement	Sandberg Rd.	\$ 154,554	\$ 154,554
<b>Stream Average Priority</b>	<b>176</b>	<b>Schoolhouse Creek (AI) Total</b>					<b>\$ 851,313</b>
<b>SCHOOLHOUSE CREEK-KEY PENINSULA</b>							
Low	110	Schoolhouse (KP)	SC-CR01	Culvert Replacement	East of KP Hwy, west of 148th Ave, on Reeves Rd.	\$ 98,825	\$ 98,825
Medium	165	Schoolhouse (KP)	SC-RST03	Stream Restoration	Reach SC03	\$ 110,000	\$ 110,000
Low	95	Schoolhouse (KP)	SCT-CR01	Culvert Replacement	Mahnke Road, Trib. to Filucy Bay	\$ 122,974	
Low	90	Schoolhouse (KP)	SCT-CR02	Culvert Replacement	Mahnke Road, Trib. to Filucy Bay	\$ 54,822	\$ 177,796
<b>Stream Average Priority</b>	<b>115</b>	<b>Schoolhouse (KP) Total</b>					<b>\$ 386,621</b>
<b>TAYLOR BAY</b>							
Medium	165	Taylor Bay	TB-RST01	Stream Restoration	Reach TB01	\$ 420,000	\$ 420,000
<b>Stream Average Priority</b>	<b>165</b>	<b>Taylor Bay Total</b>					<b>\$ 420,000</b>

**Table ES-2:  
Key Peninsula Islands Basin Plan CIPs Grouped by Stream**

Priority	Score	Subbasin	CIP name	CIP	Location	Estimated Cost (\$)	Reach Subtotal
<b>VAUGHN CREEK</b>							
Low	125	Vaughn Creek	VA-RST01	Stream Restoration	Reach VA01	\$ 60,000	\$ 60,000
Medium	175	Vaughn Creek	VA-RST02	Stream Restoration	Reach VA02	\$ 440,000	\$ 440,000
High	260	Vaughn Creek	VA-AC03	Land Acquisition	Reach VA03	\$ 289,256	\$ 289,256
Medium	165	Vaughn Creek	VA-CR04	Culvert Replacement	McFadden Rd.	\$ 146,163	
Medium	225	Vaughn Creek	VA-WTRST04	Wetland Restoration	Reach VA04	\$ 230,000	
Low	120	Vaughn Creek	VA-RST04	Stream Restoration	Reach VA04	\$ 100,000	\$ 476,163
High	270	Vaughn Creek	VA-AC05	Land Acquisition	Reach VA05	\$ 619,835	\$ 619,835
Low	105	Vaughn Creek - Tributary to Vaughn Bay	VAT-CR01	Culvert Replacement	Hall Road	\$ 316,755	
Low	70	Vaughn Creek - Tributary to Vaughn Bay	VAT-FP02	Fish Passage Project	Wright-Bliss Rd.	\$ 150,000	\$ 466,755
Medium	165	Vaughn Bay	VB-CR01	Culvert Replacement	South Vaughn Rd.	\$ 58,482	\$ 58,482
<b>Stream Average Priority</b>	<b>169</b>	<b>Vaughn Creek Total</b>					<b>\$ 2,410,491</b>
<b>WHITEMAN CREEK</b>							
Medium	145	Whiteman Creek	WH-CRNS1	Culvert Replacement	Bay Road	\$ 125,518	
Medium	145	Whiteman Creek	WH-CRNS2	Culvert Replacement	Bay Road	\$ 125,518	\$ 251,036
Medium	170	Whiteman Crk.	WH-RST01	Stream Restoration	Reach WH01	\$ 119,000	
Medium	220	Whiteman Crk.	WH-WTRST01	Wetland Restoration	Reach WH01	\$ 273,700	\$ 392,700
Low	70	Whiteman Creek	WH-CR02	Culvert Replacement	Whiteman Cove Road	\$ 119,188	\$ 119,188
Low	100	Whiteman Creek	WH-CR03	Culvert Replacement	Whiteman Road	\$ 154,200	\$ 154,200
<b>Stream Average Priority</b>	<b>142</b>	<b>Whiteman Creek Total</b>					<b>\$ 917,124</b>
<b>Total - All Projects</b>						<b>\$ 27,273,627</b>	

Print date: August 2005

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Data Source: URS subbasin delineation, February 2004. Subbasins delineated from USGS 10-meter DEMs. See Appendix A for detailed description of delineation.

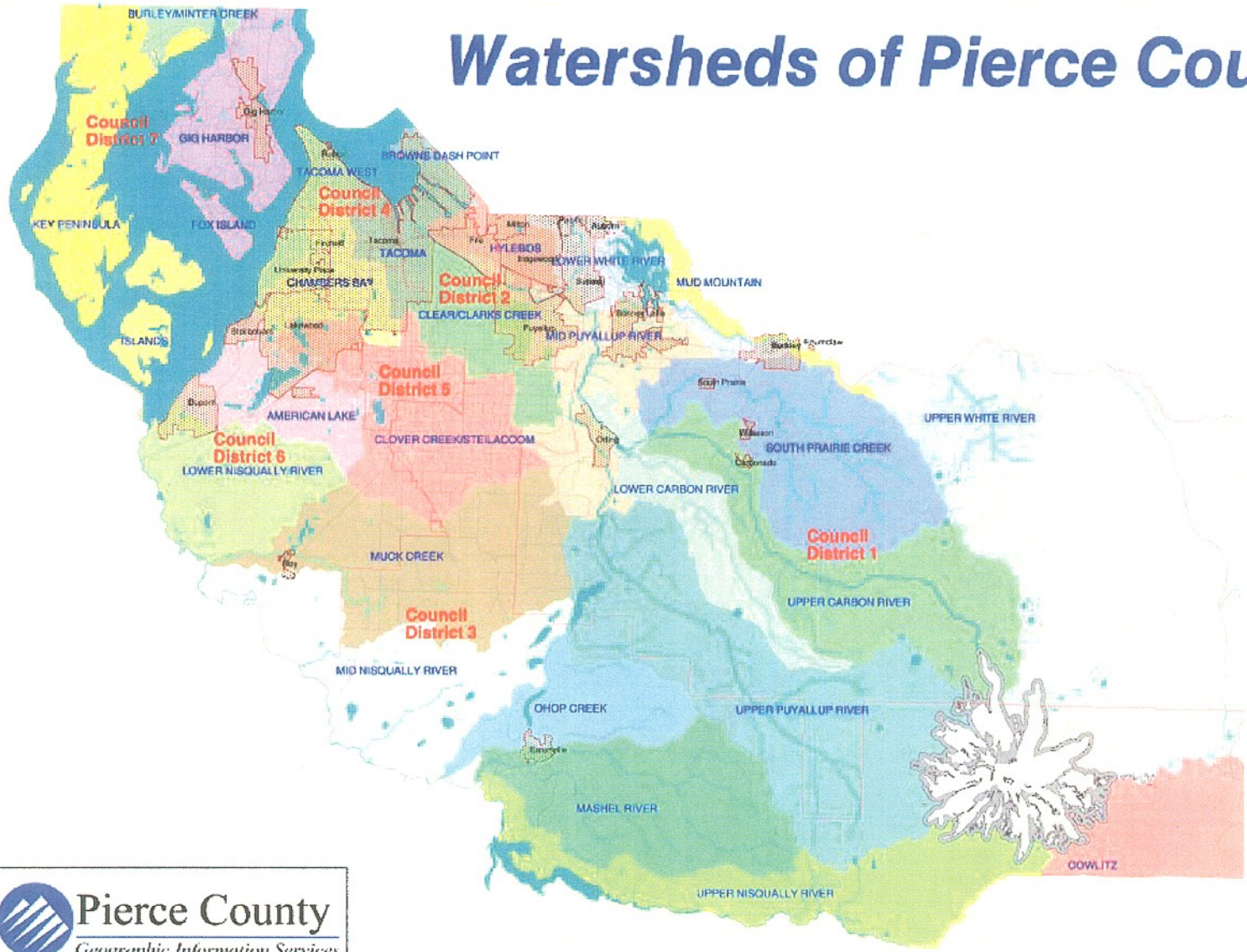
FIGURE S-1  
SUBBASIN INDEX



Pierce County  
Water Programs

KEY PENINSULA - ISLANDS BASIN PLAN  
PIERCE COUNTY, WASHINGTON

# Watersheds of Pierce County



**MAP LEGEND**

--- Council District Boundary  
 --- Cities in Pierce County

- 1 Lower/Clarks River
- 2 Chambers Bay
- 3 Clear/Clarks Creek
- 4 Hylebos
- 5 Ohop Creek
- 6 Clover Creek
- 7 South Prairie Creek
- 8 Lower Nisqually
- 9 American Lake
- 10 Key Peninsula
- 11 Middle Nisqually
- 12 Moon Creek
- 13 Mud Mountain
- 14 Ohop Creek
- 15 Lower White
- 16 Lower Carbon
- 17 Mashel
- 18 Tacoma West
- 19 Upper Nisqually
- 20 Mashel
- 21 Upper White
- 22 Upper Puyallup
- 23 Middle Puyallup
- 24 Upper Carbon
- 25 Lower Carbon
- 26 Fox Island

