



2401 South 35th Street  
Tacoma, Washington 98409-7460  
(253) 798-7210 • FAX (253) 798-3131

June 26, 2006

Dear Interested Party:

Attached is the Final Supplemental Environmental Impact Statement (Final SEIS) for the **Proposed Key Peninsula – Islands** (Basin Plan). The Final SEIS revises the Draft Supplemental Environmental Impact Statement (Draft SEIS) in response to comments received during the 30-day comment period. A new section called “Responses to Comments” has been added.

The Pierce County Department of Public Works and Utilities, Water Programs Division (Water Programs), proposes to update the *1991 Pierce County Storm Drainage and Surface Water Management Plan* by adopting a specific plan for unincorporated areas draining to Puget Sound on Key Peninsula, Anderson Island, Raft Island, and Ketron Island. The Proposed Basin Plan evaluates flooding, water quality, aquatic habitat, and other storm drainage-related problems and recommends capital improvement projects and non-structural measures to solve the problems.

This Final SEIS is prepared as a non-project environmental impact statement per Washington Administrative Code, Chapter 197-11-442. The non-project Final SEIS provides a general discussion of the probable significant adverse environmental impacts of implementing the Proposed Basin Plan and the No-Action Alternative. Many proposed actions covered in the Final SEIS will be subject to project-specific environmental review prior to construction or implementation.

There is no comment period for this Final SEIS. An appeal of the adequacy of the Final SEIS may be filed at the Pierce County Development Center, Pierce County Public Services Building, 2401 South 35<sup>th</sup> Street, Tacoma, WA 98409 by filing a notice of appeal together with an appeal fee of \$1,323 by 4:30 p.m. on July 26, 2006. More information on the appeal of a Final SEIS may be obtained at the Development Center.

The Proposed Basin Plan and Final EIS (Chapter 11 of the Plan) are posted on the County’s website at [www.piercecountywa.org/kibasins](http://www.piercecountywa.org/kibasins). Printed copies of the Proposed Basin Plan and Final SEIS may be purchased for the cost of printing at Pierce County Public Works and Utilities, Environmental Services Building, 9850 64<sup>th</sup> Street West, University Place, Washington or at the Pierce County Planning and Land Services Department at 2401 South 35<sup>th</sup> Street, Tacoma, Washington. Copies of the Final SEIS and Proposed Basin Plan can also be reviewed at the following Pierce County Library System libraries: Key Center Library, 8905 Key Peninsula Highway North, Lakebay WA; Anderson Island Library, Anderson Island WA; Peninsula Library, 4424 Point Fosdick Drive NW.



June 26, 2006

Dear Interested Party:

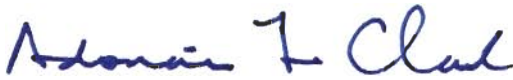
Page 2

For more information about the Final EIS, call Adonais Clark, Environmental Designee at (253) 798-7165. For questions regarding the Proposed Key Peninsula - Islands Basin Plan, contact Barbara Ann Smolko at (253) 798-6156 or Marsha Huebner, Pierce County Public Works and Utilities, Water Programs Division, at (253) 798-4662.

Sincerely,

CHUCK KLEEBURG

Director

A handwritten signature in blue ink that reads "Adonais Clark". The signature is written in a cursive style with a large initial "A" and a distinct "C".

By: Adonais Clark  
Environmental Designee

**CHAPTER ELEVEN**  
**Final Supplemental**  
**Environmental Impact Statement**

**FINAL**

**SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT**

**For The**

**KEY PENINSULA-ISLANDS BASIN PLAN**

**Prepared in compliance with the State Environmental Policy Act (RCW 43.21C)**

**June 26, 2006**

**PIERCE COUNTY**  
**PUBLIC WORKS AND UTILITIES DEPARTMENT**  
**Water Programs Division**

Brian Ziegler, P.E., Director  
Harold Smelt, P.E, Manager, Water Programs  
9850 64<sup>th</sup> Street West,  
University Place, WA 98467-1078



## Pierce County

Department of Planning and Land Services

2401 South 35<sup>th</sup> Street, Tacoma, Washington 98409-7460, (253) 798-7037 fax (253) 798-7425

### NOTICE OF AVAILABILITY

June 26, 2006

### FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT KEY PENINSULA-ISLANDS BASIN PLAN

*A Final Supplemental Environmental Impact Statement (Final SEIS) for the Key Peninsula – Islands Basin Plan* (Basin Plan) is being issued on June 26, 2006, pursuant to the State Environmental Policy Act (Revised Code of Washington 43.21C) and the Pierce County Environmental Regulations (Pierce County Code, Title 18D). The Final SEIS revises the Draft Supplemental Environmental Impact Statement (Draft SEIS) in response to comments received during the 30-day comment period. A new section called “Responses to Comments” has been added.

The Pierce County Department of Public Works and Utilities, Water Programs Division (Water Programs, proposes to update the *1991 Pierce County Storm Drainage and Surface Water Management Plan* by adopted a specific plan for unincorporated areas draining to Puget Sound on Key Peninsula, Raft Island, Anderson Island, and Ketron Island. The Proposed Basin Plan evaluates flooding, water quality, aquatic habitat, and other storm drainage problems and recommends capital improvement projects and nonstructural measures to solve the problems. For questions regarding the Basin Plan, contact Barbara Ann Smolko at 253-798-4662.

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**KEY PENINSULA-ISLANDS BASIN PLAN  
FINAL SEIS  
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## FACT SHEET

<b>Title</b>	<b><i>Key Peninsula-Islands Basin Plan.</i></b>
<b>Description of Proposed Action</b>	<p>Pierce County Public Works and Utilities, Water Programs Division proposes to update the 1991 Storm Drainage and Surface Water Management Plan (1991 Plan) and its capital improvement program by adopting and implementing a basin-specific update for the Key Peninsula-Islands drainage basin.</p> <p>The 1991 Plan has guided the identification, design, construction and implementation of surface water management facilities and surface water policies and programs throughout the County. The proposed Key Peninsula-Islands Basin Plan provides specific strategic direction on solving flooding, water quality, and associated within the Key Peninsula-Islands Basin.</p> <p>The No-Action Alternative would continue the selection of capital projects based on the 1991 Plan or as determined annually.</p> <p>The Final Supplemental Environmental Impact Statement (Final SEIS) adds information to the 1991 <i>Final Environmental Impact Statement</i> for the 1991 Plan.</p>
<b>Location of Proposal</b>	Unincorporated Pierce County on the Key Peninsula and on Fox, Raft , Anderson, and Ketron Islands
<b>Proponent</b>	Pierce County Public Works and Utilities, Water Programs Division
<b>Proponent Contact</b>	<p>Barbara Ann Smolko, Senior Planner, (253)-798-6156 or          Marsha Huebner, (253) 798-4662          Public Works and Utilities, Water Programs Division          9850 64<sup>th</sup> Street West, University Place, WA 98467-1078</p>
<b>Lead Agency</b>	Pierce County Planning and Land Services
<b>Responsible Official</b>	Chuck Kleeburg, Director, Pierce County Planning and Land Services
<b>Lead Agency Contact</b>	<p>Adonais Clark          Environmental Designee          Pierce County Planning and Land Services          2401 South 35<sup>th</sup> Street          Tacoma, WA 98409-7490          (253)798-7210</p>
<b>List of Permits and Approvals Required</b>	<p>County Council approval of an ordinance adopting the Key Peninsula-Islands Basin Plan as an update to the 1991 Storm Drainage and Surface Water Management Plan specific to the Key Peninsula-Islands Basin. Permits for construction in and adjacent to water (e.g., Hydraulic Project Approvals, Section 404 permits, Shoreline Substantial Development Permits) may be required for specific capital projects.</p>

<b>Authors and Principal Contributors</b>	Barbara Ann Smolko, Janine Redmond, Marsha Huebner, Dan Wrye, Ann Rees, Pierce County Water Programs; Ela Whelan, P.E., URS Corporation
<b>Date of DSEIS Issuance</b>	<b>January 19, 2006</b>
<b>Written Comments Due</b>	<b>February 21, 2006</b>
<b>Date of FSEIS Issuance</b>	<b>June 26, 2006</b>
<b>Public Meetings and Hearings</b>	<p>A public hearing was held on February 28, 2006 at 8:30 a.m. before the Pierce County Planning Commission at the Pierce County Public Services Building, 2401 South 35<sup>th</sup> Street, Tacoma, WA 98409.</p> <p>A public hearing will be conducted by the Economic and Infrastructure Development Committee of the Pierce County Council during the autumn of 2006.</p>
<b>Date of Final Action</b>	Action of the Pierce County Council is expected in autumn of 2006
<b>Subsequent Environmental Review</b>	Project specific environmental review for various construction projects and programmatic actions will be performed when site and implementation alternatives are identified.
<b>Location of original EIS for the 1991 Plan</b>	Pierce County Environmental Services Building 9850 64 <sup>th</sup> Street West, University Place, WA 98467-1078, (253) 798-2725; or Pierce County Planning and Land Services Department, 2401 S. 35 <sup>th</sup> St., Tacoma, WA, 98409, (253) 798-7210
<b>Cost of FSEIS</b>	<p>This FSEIS may be purchased for the cost of printing at the following location:</p> <p style="text-align: center;">Pierce County Public Works &amp; Utilities Environmental Services Building 9580 64<sup>th</sup> Street West University Place, WA 98467-1078</p> <p>A copy of the Executive Summary may be obtained at no cost from Pierce County Water Programs, (253) 798-2725</p> <p>The FSEIS, Basin Plan, and other information regarding the Basin Plan are also available at the following internet address:</p> <p style="text-align: center;"><b><u><a href="http://www.piercecountywa.org/kibasin">www.piercecountywa.org/kibasin</a></u></b></p>

# FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

## SUMMARY

Pierce County Public Works and Utilities, Water Programs Division (Water Programs) proposes adoption and implementation of the Key Peninsula-Islands Basin Plan (Basin Plan or Plan). If adopted, the Basin Plan will update the County's 1991 Storm Drainage and Surface Water Management Plan (1991 Plan).

The State Environmental Policy Act (SEPA), Chapter 43.21C RCW, requires that an Environmental Impact Statement (EIS) be prepared for proposed actions that could result in probable significant adverse environmental impacts. An EIS was prepared for the original 1991 Plan to provide full disclosure of potential impacts. The EIS compared a No-Action Alternative against the measures identified in the 1991 Plan.

This Final Supplemental EIS (Final SEIS) is prepared for the Key Peninsula-Islands Basin Plan to determine whether substantial changes in County programs resulting from the alternatives would result in "probable significant adverse environmental impacts" and to take into account "significant new information" that has been developed over the past 11 years (WAC 197-11-405(4)).

The FSEIS compares implementation of the Key Peninsula-Islands Basin Plan with a "No-Action" Alternative. The "No-Action" Alternative would be the continued implementation of capital projects based on the 1991 Plan or as otherwise determined annually.

The Basin Plan identifies existing and expected conditions influencing surface water and storm drainage within the Key Peninsula-Islands Basin. The Plan identifies problems, analyzes factors contributing to problems, and identifies and recommends both structural and nonstructural solutions to address the problems.

The Final SEIS is based on information provided in the 1991 Plan EIS. However, because some of the information provided in the 1991 EIS has changed, this Final SEIS provides new and additional information to assess the effects of the Basin Plan. Many potential impacts from 1991 Plan implementation were evaluated within the original 1991 EIS and will not be addressed again here. Copies of the 1991 Storm Drainage and Surface Water Management Plan and the 1991 Environmental Impact Statement are available for review at the Pierce County Water Programs office located at 9850 64<sup>th</sup> Street West, University Place, WA 98467-1078, 253-798-2725 and at Pierce County Planning and Land Services Department, located at 2401 S. 35<sup>th</sup> St., Tacoma, WA, 98409, 253-798-7210.

This Final SEIS addresses only the Key Peninsula-Islands Basin Plan. As other basin plans are developed, separate environmental review will occur to evaluate the specific drainage basins.

This Plan is considered a non-project proposal per WAC 197-11-704 and WAC 197-11-774. The environmental review in this Final SEIS is programmatic. Future project-specific SEPA review may be required, as appropriate, as specific recommendations are implemented.

The Key Peninsula-Islands Basin Plan is one of several basin plans Pierce County is preparing to update the 1991 Plan. The 1991 Plan evaluated 26 drainage basins comprising non-federal lands and unincorporated areas of Pierce County. The basins were evaluated at different levels, depending upon whether they were considered urban or rural. The eight urban and urbanizing areas were studied in more detail. The Key Peninsula-Islands Basin was studied as a rural area.

Since the 1991 Plan was prepared, surface water management has increased in complexity. Growth in the County has made development impacts more widespread and obvious. In the early 1990s the State Growth Management Act led to the establishment of “Critical Areas”, such as wetlands and streams, a requirement for protection of adjacent buffer areas, and the adoption of the Pierce County Comprehensive Plan. In 2005, land use of the study area was characterized as 36% low-density residential, 19% resource-use, and 29% vacant and/or open space. Most of the development consists of residential subdivisions replacing existing vacant areas.

Since 1991, there has been a growing emphasis on the protection of water quality and streams, wetlands and other environmentally sensitive areas. In the mid-1990’s, jurisdictions with populations over 100,000, including Pierce County, were required to create stormwater programs under the federal Clean Water Act’s National Pollutant Discharge Elimination System (NPDES) program. In the late 1990s, the federal government listed Chinook salmon, bull trout, and other fish species found in Pierce County waters under the “Endangered Species Act.” Any adverse impact to a listed species is considered to be significant.

These factors led Water Programs to prepare the Key Peninsula-Islands Basin Plan, along with a number of other basin plans for similar areas. The Basin Plan evaluates current conditions and problems and prioritizes recommended projects. It recommends capital improvement projects and changes in policies and planning efforts needed to meet the requirements of the “Clean Water Act,” the “Endangered Species Act”, and the “Growth Management Act.”

The Key Peninsula-Islands Basin Plan includes both structural and non-structural measures to address flood and drainage problems, improve fish passage, improve water quality conditions, and improve stream and riparian habitat in the basin. Structural measures included in the Basin Plan address flooding and drainage problems, and they improve associated fish passage and water quality conditions in the basin. Non-structural measures are included to improve water quality conditions and improve stream and riparian habitat. Some measures would be implemented as a part of Water Programs’ Capital Improvement Program, others as part of the division’s maintenance program, through existing plans such as the *Key Peninsula-Gig Harbor-Islands Watershed Characterization and Action Plan*, or by other agencies.

Capital improvement project recommendations in the Basin Plan consist of replacing 27 culverts and constructing three (3) fish passage projects, for a total of 30 projects, including the following:

- 10 culverts that are both flood hazards and fish passage barriers.

- 2 culverts that are potential flood hazards
- 15 culverts and 3 fish passage projects that are primarily fish passage barriers.

Non-structural (“programmatic”) recommendations in the Basin Plan include:

- Increased inspections for compliance with stormwater and NPDES permit requirements;
- Implementation of a program to enhance degraded riparian habitat and water quality;
- Implementation of public education, technical assistance and outreach programs;
- Implementation of a low impact development (LID) program;
- Implementation of basin-specific stream protection measures (such as coordination on fencing for livestock, installation of permanent markings for stream buffer areas);
- Implementation of a land management program for floodplain habitat protection;
- Implementation of a shellfish protection program,
- Development and implementation of a surface water quality monitoring program.
- Development and implementation of a stormwater education program for shoreline property owners;
- Development and implementation a best management practices (BMP) manual for Water Programs’ maintenance activities;
- Development and implementation of a habitat monitoring program;
- Establishing a wetlands banking or advance mitigation program for Water Programs;
- Provide technical assistance to non-profit groups installing fish passage projects; and
- Development and implementation of an invasive species management program.

Table 11-1 summarizes and compares impacts on environmental elements anticipated from the Proposed Key Peninsula-Islands Basin Plan and the No-Action Alternative.

**Table 11-1: Comparison of Impacts**

Element	"Proposed Action"	Probable Significant Adverse Environmental Impact?	"No-Action" Alternative	Probable Significant Adverse Environmental Impact?
Water Resources	<ul style="list-style-type: none"> <li>• Short-term adverse impacts to water quality may occur, associated with construction of capital improvement projects. Mitigation for these impacts would be in the form of construction-related Best Management Practices to reduce erosion and sediment transport.</li> <li>• Implementation of the KI Plan is expected to result in long-term benefits for water resources.</li> </ul>	No	<ul style="list-style-type: none"> <li>• Flooding problems may continually occur at the undersized culvert locations throughout the Basin, without replacement efforts as identified in the KI Basin Plan.</li> <li>• Long-term adverse impacts to salmonids may occur, as extensive portions of the streams in the Basin could remain inaccessible because of culverts that form fish passage barriers.</li> <li>• Long-term adverse impacts to riparian habitat and water quality could occur without implementation of programmatic measures such as water quality monitoring and increased buffer widths.</li> <li>• Long-term impacts to streamside vegetation could continue with development, despite recently implemented buffer regulations, due to vested rights of developers.</li> </ul>	Potential
Fishery Resources	<ul style="list-style-type: none"> <li>• Short-term, adverse impacts to water quality may occur during construction of culvert replacements and stream restoration projects. Such projects may increase stream sediment loads. Mitigation for these impacts would be in the form of construction-related Best Management Practices to reduce erosion and sediment transport.</li> <li>• Implementation of the KI Plan is expected to result in long-term benefits for fishery resources.</li> </ul>	No	<ul style="list-style-type: none"> <li>• Probable, long-term adverse impacts related to fish migration may occur because there is no assurance of the timely removal of fish passage barriers.</li> <li>• Long-term impacts to streamside vegetation could continue with development, despite recently implemented buffer regulations, due to vested rights of developers.</li> <li>• Long-term, adverse impacts to fish habitat may occur because of the lack of riparian habitat protection and probable, ongoing water quality degradation.</li> </ul>	Potential

Element	"Proposed Action"	Probable Significant Adverse Environmental Impact?	"No-Action" Alternative	Probable Significant Adverse Environmental Impact?
Vegetation	<ul style="list-style-type: none"> <li>Existing, low-growth vegetation (e.g. grasses, shrubs) throughout project areas may temporarily be adversely impacted by the movement of equipment and materials during construction of capital improvement projects.</li> <li>Implementation of the KI Plan is expected to result in long-term benefits for vegetation. When feasible, existing beneficial native vegetation will be left in place and protected during projects. Additional beneficial native vegetation will be added, and non-native vegetation with little or no habitat, cover, or food benefit will be removed.</li> </ul>	No	<ul style="list-style-type: none"> <li>Long-term impacts to streamside vegetation could continue with development, despite recently implemented buffer regulations, due to vested rights of developers.</li> <li>Riparian corridor conditions in the Basin may continually degrade because of the lack of protection or improvement of riparian habitat.</li> <li>Because no activities will specifically target removal of non-native vegetation, long-term adverse impacts related to wildlife habitat, stream cover, and food supply may occur.</li> </ul>	Potential
Wildlife	<ul style="list-style-type: none"> <li>Short-term, adverse impacts may result from construction activities that temporarily displace wildlife.</li> <li>Short-term, adverse impacts may result from the removal of invasive and non-native plants species, which could temporarily displace wildlife due to loss of cover.</li> <li>Implementation of the KI Plan is expected to result in long-term benefits for wildlife.</li> </ul>	No	<ul style="list-style-type: none"> <li>Over the long-term, wildlife could be adversely impacted by not ensuring protection or improvement of riparian habitat and water quality.</li> <li>Implementation of ongoing riparian restoration projects (per the Pierce Conservation District's activities) may result in modest improvements to the riparian areas and wildlife habitat.</li> </ul>	Potential
Land and Shoreline Use	<ul style="list-style-type: none"> <li>No adverse impacts are expected.</li> </ul>	No	<ul style="list-style-type: none"> <li>No adverse impacts are expected, but continued implementation of 1991 Plan, which pre-dates County Comprehensive Plan, would continue to promote the inherent inconsistencies between the two Plans.</li> </ul>	Possible
Aesthetic, Historic & Cultural Resources	<ul style="list-style-type: none"> <li>No adverse impacts are expected.</li> </ul>	No	<ul style="list-style-type: none"> <li>No adverse impacts are expected.</li> </ul>	No
Public Services, Utilities, Transportation, and Recreation	<ul style="list-style-type: none"> <li>Short-term adverse impacts may occur as a result of construction activities on culverts. Impacts include temporary road and lane closures, which results in potential delays for emergency vehicles.</li> <li>Implementation of the KI Plan is expected to result in long-term benefits for overall public services.</li> </ul>	No	<ul style="list-style-type: none"> <li>Flooding problems could occur in the basin at the undersized culverts identified in the basin plan analysis.</li> <li>Long-term public safety could deteriorate as a result of these potential flooding problems.</li> </ul>	Potential
Soils	<ul style="list-style-type: none"> <li>There is increased potential for short-term adverse water quality impacts as a result of construction activities that increase instream sediment loads during culvert replacement and stream restoration projects.</li> </ul>	No	<ul style="list-style-type: none"> <li>No adverse impacts are expected.</li> </ul>	No

Element	"Proposed Action"	Probable Significant Adverse Environmental Impact?	"No-Action" Alternative	Probable Significant Adverse Environmental Impact?
	Mitigation for these impacts would be in the form of construction-related Best Management Practices to reduce erosion and sediment transport. <ul style="list-style-type: none"> <li>Implementation of the KI Plan is expected to result in long-term benefits for soils.</li> </ul>			
Air Quality	<ul style="list-style-type: none"> <li>No adverse impacts are expected.</li> </ul>	No	<ul style="list-style-type: none"> <li>No adverse impacts are expected.</li> </ul>	No

This Final SEIS is a subsection of the overall Key Peninsula-Islands Basin Plan. Because the Plan includes detailed descriptions of the environmental components of the Plan, much of the FSEIS summarizes and/or refers to other sections in the Plan. The Basin Plan is organized as follows.

Chapter 1 contains an introduction to the Basin Planning program, the goals and objectives of the program, and a summary of the report’s organization. Chapter 2 provides a description of the regulatory context in which the Basin Plan was prepared including existing and related planning programs. Chapter 3 describes stakeholder involvement in plan preparation.

A description of existing physical, biological, and socioeconomic conditions in the Key Peninsula-Islands Basin is contained in Chapter 4. The chapter describes the environmental resource elements throughout the basin focusing on stream reaches, associated wetlands, sensitive areas, fish habitat, areas of localized flooding, and future land use changes that could increase environmental degradation. Chapter 4 includes a detailed description of surface streams in the basin and their condition as recorded in the course of field surveys conducted in October and November of 2003.

Chapter 5 identifies various problems in the Basin including flooding, poor surface water quality, and degradation of fish and wildlife habitat. Problems are analyzed and conceptual solutions are developed in Chapters 6, 7 and 8. The development of Basin Plan recommendations is described in Chapter 9. Chapter 10 contains the Basin Plan itself.

The elements of the environment sections of the Final SEIS summarize and refer to specific sections of Chapters 4, 5, 6, 7, 8, and 9 where appropriate. Other environmental elements that are not addressed in the Basin Plan are summarized based on the 1991 EIS and updated information. The description of alternatives section in the Final SEIS summarizes and refers to Chapter 10 of the Basin Plan, where appropriate.

Citizens within the Basin provided information for the Plan at public meetings. Concerns about flooding, water quality, and habitat have been incorporated into the format and substance of the Plan’s recommended actions.

## ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This section describes alternatives to achieve the long-term goals of the Pierce County Storm Drainage and Surface Water Management Plan (1991 Plan). The alternatives evaluated are the **Proposed Action**, adoption of the Basin Plan for the Key Peninsula-Islands Basin, and the **No-Action Alternative**, continued capital project selection based on the 1991 Plan or as otherwise determined annually. This section also provides background on the original 1991 Plan that would be altered by the Key Peninsula-Islands Basin Plan.

### Introduction and Background

#### **Background—Pierce County Storm Drainage & Surface Water Management Plan**

The Pierce County Council established the County's Surface Water Management Utility in March 1988 by Ordinance 87-205. In 1991, the County adopted the original Stormwater Drainage and Surface Water Management Plan (1991 Plan). The 1991 Plan was intended to provide a comprehensive program for surface water management operations, funded by service charges. The 1991 Plan was also prepared to satisfy Washington State Department of Ecology requirements for a Comprehensive Flood Control Management Plan (WAC 173-145).

The 1991 Plan addressed all 26 of the drainage basins in Pierce County to varying degrees. Urban areas were studied in more detail than rural basins. Eight basins were studied in detail: Gig Harbor, Hylebos Creek, Clear/Clarks Creek, Clover/Steilacoom Creek, Chambers Bay, Tacoma West/Browns-Dash Point, Muck Creek and American Lake.

Non-structural recommendations in the 1991 Plan tend to be broad and county-wide rather than basin or study area specific. The 1991 Plan focused primarily on projects aimed at addressing flooding problems existing at the time. The 1991 Plan recommended specific flooding solution projects for a Capital Improvement Program (CIP). The long-term goals were to be goals for the life of the program. Table 11-2 shows the goals of the 1991 Plan.

**Table 11-2: Goals of Pierce County Storm Drainage and Surface Water Management Plan (1991 Plan)**

Goal	Description	Objectives
1. Prevent the Loss of Life, the Creation of Public Health or Safety Problems and the Loss or Damage of Public and Private Property	Prevent the loss of life or property due to flooding events.	<p>Nonstructural measures should be preferred over structural measures. Protection of existing facilities and structures should take preference over the protection of undeveloped lands.</p> <p>Land use and related regulations and zoning should reflect the natural constraints of the streams, floodplains, meander zones, and riparian habitat zones. Together, this plan, program and codes should present consistent goals and objectives.</p>
2. Establish and Adopt a Systematic and Comprehensive Approach	Storm water management should occur in the context of an ongoing, systematic and comprehensive approach to solving existing problems and preventing future problems.	<p>Continue the role of the Citizens Advisory Committee or similar body in an advisory role to the Utility. The body should represent the entire County and citizens with a variety of [sic] reasons for their interest in surface water management.</p> <p>Strategies for surface water management should balance engineering, economic, environmental, and social factors in relationship to stated comprehensive planning goals and objective.</p> <p>Public understanding of the various capabilities and limitation associated with storm water management should be improved through a variety of educational efforts.</p> <p>The goals and objectives of the 1991 Plan should be evaluated at regular intervals (i.e., every 5 years) to maintain consistency with other related programs affecting the environment.</p>
3. Minimize Expenditure of Public Funds	The need for emergency measures should be reduced or prevented through planning, and the use of structural and nonstructural measures.	A stable, adequate, and publicly acceptable long-term source of financing should be established and maintained for the Utility and the comprehensive management program.
4. Maintain the Varied Uses of the Existing Natural Drainage System Within the County	Storm water management in Pierce County should occur in the context of the varied uses associated with the natural drainage systems within the County. These include agricultural, commercial, industrial and residential, fish and wildlife habitat, water supply, open space, and recreation.	<p>Storm water management measures should preserve to the fullest extent possible opportunities for other uses.</p> <p>Structural flood control measures should not obstruct fish passage.</p> <p>Structural flood control measures should preserve or enhance existing flow characteristics for fisheries, and other uses of the riparian zone.</p> <p>Flood control activities should not result in a net loss of, or damage to fish and wildlife resources, but wherever possible develop or improve the diversity of habitat.</p>

<b>Goals of Pierce County Storm Drainage and Surface Water Management Plan (1991 Plan) (continued)</b>		
<b>Goal</b>	<b>Description</b>	<b>Objectives</b>
4. Maintain the Varied Uses of the Existing Natural Drainage System Within the County <i>(continued)</i>	Preserve to the fullest extent possible, the scenic, and ecological qualities of the natural drainage system in harmony with those uses which are deemed essential to the life of its citizens, and wherever possible, enhance the instream and riparian uses of the streams, wetland and lakes of Pierce County.	Changes in land use should try to restore the lands natural character to the natural state whenever possible.
5) Prevent the degradation of the quality of both surface water and the water entering the regions aquifers.	Urbanization normally leads to a degradation in the quality of storm water runoff. This can become a problem both for the wildlife which depends on the stream system and the local populace.	<p>The use of the natural drainage system is preferred over the use of pipelines or enclosed detention systems. The preservation of natural wetland, floodplains and streams is to be actively pursued.</p> <p>The County will apply for a NPDES permit and will strive to be in compliance with the requirements for the preservation of water quality.</p> <p>All storm water runoff from impervious surfaces should be treated before it is allowed to enter the natural drainage system, infiltrate into the ground or enter Puget Sound.</p>
6) Coordinate with Public and Private Sectors	Storm water management measures should be compatible with the various public and private sectors affected.	<p>Planning and design/construction of storm water management measures should include opportunity for identification of acceptable storm water management measures.</p> <p>The Citizens Advisory Committee should provide input on existing or pending regulations which are incompatible with the goals of the 1991 Plan. Efforts should be made to work with the Cities towards standardization of regulations which impact storm water management.</p>

### **Use of 1991 Plan As Principal Focus of CIP Has Evolved**

The 1991 Plan has been used as a basis for Capital Improvement Program (CIP) proposals over the years since 1991. Projects are selected every year and adopted by the County Council as part of the County's six-year Capital Facilities Plan under the County's Comprehensive Plan. Although many of the projects still come from the original 1991 Plan, there are also many that have been developed as the result of more recent information and that were not contained within the 1991 Plan. Additionally, since the 1991 Plan was developed, the cities of University Place, Lakewood and Edgewood have incorporated. The incorporations eliminated the County's responsibility for capital projects in those areas. Other cities such as Roy, Bonney Lake, Gig Harbor, and Fife have annexed adjoining areas, reducing the County's area of jurisdiction. These changes have affected project funding, planning, construction, and maintenance activities.

The 1991 Plan was developed before the adoption of the County Comprehensive Plan, developed pursuant to the Growth Management Act. Zoning and other land use regulations have changed development patterns in some parts of the County, and the future growth estimates used to develop the 1991 CIP list are no longer valid.

Finally, Water Programs has constructed many of the projects proposed as part of the 1991 Plan, while others could not be constructed because development patterns have made acquisition of construction sites prohibitively expensive.

### **Proposed Action: Basin Plan Alternative**

The proposed action is adoption and implementation of the Basin Plan for surface water management of the Key Peninsula-Islands Basin. The Plan documents the existing condition of the basin's water resources, identifies water resource problems and issues, and recommends a plan to improve conditions in the basin. It includes recommendations for capital projects and programmatic activities to remedy existing problems and to prevent future water resource problems. Plan goals are translated into a comprehensive list of basin needs and action recommendations, including projects, programs, and policies to address the water quality, flooding, and associated habitat problems identified in the Plan.

The Basin Plan would update the 1991 Plan, including the CIP. Projects included in the Basin Plan would supplement and update the 1991 CIP. Programmatic recommendations would augment and/or replace the nonstructural recommendations contained in the 1991 Plan. The Basin Plan will provide guidance for Pierce County's future Capital Improvement Projects (CIP's), capital expenditures, water resource protection policies, and public education programs in the Key Peninsula-Islands Basin.

The Key Peninsula-Islands Basin Plan includes both structural and non-structural measures to address flood and drainage problems, improve fish passage, improve water quality conditions, and improve stream and riparian habitat in the basin. Structural measures are included in a Capital Improvement Program (CIP) to address flood and drainage problems, improve fish passage, and improve water quality conditions in the basin. Non-structural measures are

included to improve water quality conditions and improve stream and riparian habitat. Some measures will be implemented as a part of Water Programs' Capital Facilities Plan (CFP), others may be completed as part of a maintenance program, through the implementation of plans such as the *Key Peninsula-Gig Harbor-Islands Watershed Characterization and Action Plan*, or by other agencies.

The Basin Plan also contains recommendations for public education and opportunities for public involvement. The Plan also provides recommendations for long-term monitoring to document the improvements to habitat and water quality. Finally, the Plan recommends increased compliance assurance activities.

The proposed CFP includes recommendations to replace 30 culverts and to construct three (3) fish passage projects, a total of 33 projects, including the following:

- 10 culverts that are both flood hazards and fish passage barriers
- 5 culverts that are a potential flood hazards
- 15 culverts and 3 fish passage projects that are barriers to fish passage

The Basin Plan identifies the need for specific property acquisition and riparian habitat protection or enhancement activities. Specific needs will be revisited annually, based on monitoring of the effectiveness of proposed actions and existing local land development regulations.

Recommendations for programmatic activities to monitor, protect, and/or improve water quality conditions and stream and riparian habitat are discussed in Section 10.2 of the Basin Plan. Programmatic recommendations include the following activities:

- Increased inspections for compliance with stormwater requirements and NPDES permit;
- Implementation of a program to enhance degraded riparian habitat and water quality;
- Implementation of public education, technical assistance and outreach programs;
- Implementation of a low impact development (LID) program;
- Implementation of basin-specific stream protection measures (such as coordination on fencing for livestock, installation of permanent markings for buffer areas);
- Implementation of a land management program for floodplain habitat protection;
- Implementation of shellfish protection program,
- Development and implementation of a surface water quality monitoring program.
- Development and implementation of a stormwater education program for shoreline property owners;
- Development and implementation a BMP manual for Pierce County Water Programs maintenance activities;
- Development and implementation of a habitat monitoring program;
- Establishing a wetlands banking or advanced mitigation program for Water Programs;
- Provide technical assistance to non-profit groups installing fish passage projects; and
- Development and implementation of an invasive species management program.

Each project in the Basin Plan is rated and assigned a priority rating using standardized criteria. The criteria reflect policies in the 1991 Plan, the Comprehensive Plan for Pierce County, Draft Tri-County proposal for Salmon Habitat Enhancement, and Federal Emergency Management Guidelines. The prioritization involves assignment of points related to the accomplishment of program goals and objectives.

The criteria used to evaluate the assignment of points includes:

- Flood reduction (level and frequency)
- Water quality improvement (source reduction)
- Natural resource improvement (restoration and protection)
- Recreational and multiple use opportunities
- Aesthetics

### **No-Action Alternative**

The No-Action Alternative includes the continued management of stormwater facilities using the 1991 Plan as its guide within unincorporated Pierce County. This includes continuing the activities of the Water Programs Division of the Pierce County Public Works and Utilities Department.

The Water Programs Division would continue to be responsible for planning, design, permitting, and construction of surface water management facilities in unincorporated Pierce County. Included in the Division's responsibilities are compliance with the stormwater quality management requirements of the Clean Water Act, implementation of any watershed action plans for purposes of addressing nonpoint sources of water pollution, preserving existing levels of flood protection through the use of stormwater drainage and flood reduction facilities, stream gauging and water quality monitoring, gathering rainfall data, and emergency response and public education as it relates to stormwater quality and quantity.

There were no specific capital improvement recommendations for the Key Peninsula Islands Basin in the 1991 Plan. However, the 1991 Plan identified a number of non-structural measures to improve storm water and surface water management throughout the County. These include:

- Economic incentives for resource protection
- Floodplain/wetland protection
- Floodproof existing structures
- Relocation of existing structures out of the floodplain
- Public education related to water resource issues
- Property owner purchase of flood insurance
- Land use management techniques, including floodplain zoning ordinances, building codes, clearing and grading ordinances, subdivision ordinances, stormwater management ordinances, and stream corridor density regulation
- Flood warning/preparedness system

## Comparison of Alternatives

Table 11-3 summarizes major characteristics of the proposed Key Peninsula-Islands Basin Plan and the No-Action Alternative, referenced by continuing implementation of the 1991 Plan.

**Table 11-3**  
**Comparison of Alternatives**

Feature	Basin Plan	No-Action Alternative
Flooding Solutions	X	
Water Quality Solutions	X	
Habitat Solutions	X	
Annual Capital Facilities Element	X	X
Comprehensive, strategic	X	
Focus on specific projects	X	X
Focus on basin problems	X	
Countywide programmatic or non-structural solutions		X
Basin-specific programmatic or non-structural solutions	X	
Prioritizes within basin	X	
Prioritizes countywide		X

## AFFECTED ENVIRONMENT, SIGNIFICANT IMPACTS, AND MITIGATION MEASURES

This section discusses existing environmental conditions for those elements of the natural and built environment that may be adversely affected by adoption of the Key Peninsula-Islands Basin Plan or the No-Action Alternative. For each of the affected environment subject areas, the significant impacts that are expected to occur and the proposed mitigation measures are discussed.

### Water Resources

#### Affected Environment

Surface water hydrology, surface water quality, groundwater hydrology and groundwater quality in the Key Peninsula-Islands Basin are discussed in detail in Chapter 4, 5, 6, and 7 of the Basin Plan.

The Key Peninsula-Islands Basin is drained by a number of fairly small streams and a few larger streams. The major streams are Huge, Little Minter, Minter, Purdy, Rocky, Burley, East Fork Rocky (Muck), Lackey, Schoolhouse, Dutcher, and Vaughn Creeks. Table 4-1 in the Basin Plan shows the stream names, stream numbers, and stream abbreviations used in the Basin Plan. The catchments of the streams vary in size from a few hundred acres to approximately 12.3 square miles. East Fork Rocky (Muck), Huge, Rocky, Minter, Purdy, and Schoolhouse Creeks drain the largest catchments. The larger creeks are perennial. Most of the land close to the tops of the bluffs drains to small, unnamed, ephemeral creeks which discharge directly to Puget Sound. The characteristics of the stream corridors in the individual basins are discussed in detail in Sections 4.6 through 4.8 of the Basin Plan.

Four types of interrelated water resources problems were identified in the Key Peninsula-Islands Basin: flooding problems, surface water quality problems, degradation of fish and wildlife habitat in stream corridors, and potential conflicts between land use and stream health. Chapter 5 of the Basin Plan provides an overview of the processes used to identify problems in the basin. Chapters 6, 7, and 8 provide detailed analyses of flooding, water quality, and habitat degradation and land use problems in the basin, respectively. A summary of the information in these chapters is provided below.

#### Flooding

There have been few serious flooding incidents in the Key Peninsula-Islands Basin because of the nature of the terrain and the lack of structures within floodplains. Almost all of the flooding problems that occur under existing conditions are localized and relatively minor. In general, the existing drainage system appears to have sufficient capacity to carry storm water away from structures at the current level of urban development. Most of the reported problems are likely the result of debris accumulating in culverts and ditches and probably could be

solved by improved maintenance. A few problems may be the result of deficiencies in the sizing and capacity of engineered drainage system components, primarily culverts.

Flooding problems may be exacerbated, and new problems may emerge, as development continues. Mathematical models that simulate the hydrology and hydraulics of a watershed were used in the Basin Plan to predict and describe potential future flooding problems. The locations of predicted existing and future flooding problems are shown in Chapter 6.

Due to the topography of the basin, it is expected that if flooding does occur in the future it will most likely be associated with road and driveway culverts because the culverts represent constrictions in the natural drainage system. For the Basin Plan study, modeling was focused on the hydraulic performance of publicly-owned culverts on the major streams that drain the basin. The results of these modeling efforts are described in Chapter 6. As indicated in Table 6-1, the model predicts that existing and future road flooding could occur at 13 of the 27 culverts analyzed. Modeling indicates potential road flooding at 3 of the culverts during the 100-year storm event under future land-use conditions, 4 culverts may cause flooding during the 100-year storm event under existing land-use conditions, another 4 culverts may flood during the 25-year storm event under existing land use conditions, and 2 culverts may flood during the 2-year storm event under existing conditions. Fifteen of the 27 culverts analyzed do not meet Pierce County's current design standards because they would be surcharged to a greater degree than is allowed by the standards during the 100-year event.

### **Water Quality**

Almost all of the available data indicate that water quality in streams in the Key Peninsula-Islands Basin is generally good, with the exception of elevated bacteria levels in some locations. Waters are generally well oxygenated, and water temperature and turbidity are low. Water temperature measurements were taken by grab samples during field data collection in October and November 2003. Data from continuously reading thermographs during 2004 also indicates compliance with water temperature standards. Sources of water quality problems in the Basin are primarily related to human activities, particularly farming and riparian degradation. Much of the land adjacent to streams in the Key-Peninsula Basin is in agricultural use, and livestock typically has direct access to the water while vegetative buffers are typically reduced or eliminated to allow for more farming and grazing area.

The conclusion that freshwater systems in the Key Peninsula-Islands Basin are generally good should be viewed as provisional. Most of the data collected is from sampling locations close to the mouths of the creeks. Water quality could be worse at locations upstream in the watershed.

Macroinvertebrate samples taken in September 2003, and September and October 2004, indicate that while streams have been adversely affected by human activities, many pollution-sensitive macroinvertebrate species are present. This suggests that the streams of the basin are relatively free of toxic substances.

## Habitat

Human activity in the Key Peninsula-Islands Basin has degraded the quality of fish and wildlife habitat within stream corridors. The causes of habitat degradation are several and interrelated. They include changes in basin hydrology, loss of riparian vegetation, and creation of barriers to fish passage.

A team of technical specialists assessed the condition of fish habitat and the riparian corridor along the streams of the Key Peninsula-Islands Basin. Approximately 20 miles (110,000 feet) of stream were examined. Aquatic habitat in 72% of the stream miles was rated as in “Good” condition, 14% was rated as in “Fair” condition, and 14% was rated as in “Poor” condition. The riparian corridor in 73% of the stream miles examined was rated as in “Good” condition, 13% was rated as in “Fair” condition, and 14% was rated as in “Poor” condition. The condition of the riparian corridor provides an indication of the value of streamside habitat for amphibians, birds, and mammals.

Of the creeks examined, Kingsman Creek, Lackey Creek, and East Fork Rocky (Muck) Creek are in the overall best condition with 100% of fish habitat and riparian corridor rated in “Good” condition. Other creeks in good condition include Herron Creek (Knackstedt), with more than 90% of aquatic habitat and 100% of the riparian corridor rated in “Good” condition; Rocky Creek, with more than 90% of the aquatic habitat and riparian corridor rated in “Good” condition; and Minter Creek, with more than 80% of aquatic habitat and 70% of the riparian corridor rated in “Good” condition. Rocky Creek has more linear feet of aquatic habitat and riparian corridor in good condition than any other stream in the basin.

There are a number of man-made barriers to fish passage on streams in the Key Peninsula-Islands Basin. Prior to the 1990s, fish passage on small streams was given little consideration. Public and private parties typically used culverts to convey small streams under highway and driveway fills because they were less expensive than fish-friendly bridges would be. Today, many existing road and driveway culverts prevent or hinder the movement of fish from salt water to freshwater and from one stream reach to another. Culverts represent fish barriers because they are typically installed at an improper gradient, designed for too long an expanse, or not large enough to accommodate the stream flow. Barriers to fish passage in the Key Peninsula-Islands Basin were identified by URS stream survey teams and by Pierce Conservation District.

Some creeks in the basin are relatively free of fish passage barriers. East Fork Rocky (Muck) Creek, Lackey Creek, and Taylor Bay Creek are free of barriers. Migrating salmonids can access about 14,000 feet of Minter Creek, 10,500 feet of Rocky Creek and 7,135 feet of Huge Creek before encountering a barrier to upstream movement. In all other creeks surveyed, barriers generally prevent fish obtaining access to any more than the most downstream reaches.

Land use affects both stream health and the extent and frequency of flooding. Each sub-basin in the Key Peninsula-Islands Basin has particular land uses that pose specific problems for stream health. The predominant land use type in the basin is low-density residential use and this will continue to be so in the future. Based on the stream health data gathered as a part of

the Basin Plan, stream health appears to be most influenced by conditions in the stream corridor itself, with conditions in the watershed as a whole playing a secondary role.

### ***Significant Impacts to Water Resources and Proposed Mitigation Measures***

#### **Proposed Action**

The Proposed Action recommends a list of capital improvement projects to improve drainage, fish passage, and water quality in the basin streams. It includes recommendations for 30 construction projects, including replacement of 27 culverts and construction of 3 fish passage projects, 15 culverts and 3 fish passage projects are fish passage barriers, 2 culverts are projected to be a flood hazard, and 10 culverts are both flood hazards and fish passage barriers. Six of these culverts do not meet the County design standard, with headwater-to-diameter ratios ranging from 1.7 to 4.2.

The long-term effects of these projects would be a net improvement in the drainage conditions, fish passage and water quality in the basin. The culvert replacement projects at flood hazard culverts would result in stream crossings that meet current county road standards and substantially reduce the potential for road flooding in the basin. The culvert replacement projects at culverts barring fish passage would significantly increase the habitat accessible to anadromous salmonids and other fish migrating upstream and downstream.

The Key Peninsula-Islands Basin Plan (Basin Plan) also includes recommendations for implementing programmatic measures to encourage private landowners to protect and improve riparian habitat and water quality. In addition, programmatic and capital improvement projects are recommended to implement property acquisition and aquatic and riparian habitat protection or enhancement. These protection and enhancement projects would be completed to improve fish and wildlife habitat and water quality if analyses of basin conditions show that voluntary riparian habitat and water quality protection and improvement measures are not adequately meeting basin needs. Programmatic measures would help ensure that new development abides by recently implemented buffer regulations, minimizing the influence of the vested right of developers. The KI Basin Plan identifies areas where floodplain acquisition and riparian and aquatic habitat protection or enhancement could be undertaken to improve fish and wildlife habitat and water quality. Individually and comprehensively, these projects would improve the riparian corridor, providing additional filtration, sedimentation, and infiltration of runoff from adjacent lands. The effect of the additional sedimentation and filtration would be an improvement of water quality through a reduction in nutrients, pathogens, and sediments reaching the streams.

The tree cover associated with improved riparian corridors would provide shade for the streams, reducing the elevated water temperature experienced in the streams during the warmer days of the summer and early fall. Temperature fluctuations in the streams would also be reduced. The beneficial nutrient, pathogen and sediment reductions would occur in the first several years as the ground cover within the riparian buffer became established. The beneficial

stream shading effects would take several decades to take full effect as the planted trees grew to maturity.

A number of short-term adverse effects may occur as a result of construction activities associated with CIP implementation. Instream water quality may be impaired as a result of various construction practices. Construction activities in close proximity to surface water bodies may result in the temporary removal of streamside vegetation, which increases streambank erosion and sediment transport. Culvert replacement would disturb the streambanks and bottom. Stream restoration, streambanks stabilization and riparian revegetation projects would also disturb streams and adjacent areas. Where these disturbed areas come in contact with flowing waters, sediment would be mobilized and quickly carried downstream, temporarily reducing water quality. Subsequent deposition of sediment could also harm fish habitat. Construction sites, regardless of proximity to surface water bodies, are typically a source of elevated sediment loads during rainfall events.

Standard erosion control measures would be implemented during construction activities to avoid serious sedimentation problems. Work adjacent to or within streams will be limited to low flow periods, typically the summertime. Stream flows could be temporarily diverted and pumped around the active project site, avoiding the disturbed areas. Standard erosion control measures such as silt fencing, coverage of exposed earth and permanent seeding of disturbed areas following construction will further reduce temporary sediment and water quality impacts. Each project will be required to meet County construction and erosion control requirements, as well as applicable state and federal requirements. For instance, those projects taking place within a stream must meet the requirements of the State Department of Fish and Wildlife for a Hydraulic Project Approval (HPA). The standard requirements for control of erosion and other construction-related pollutants, such as fuels and lubricants, assure that the water quality impacts will be short-term and not significant.

The public education program recommended in the Basin Plan would raise the level of awareness on the part of residents regarding existing and potential water resources issues in the Key Peninsula-Islands Basin. Residents would also become more aware of the effects that their personal actions can have on the streams, such as landscaping practices. Of particular importance in this basin is the education of rural residential and agricultural property owners to maintain and/or establish riparian corridors to act as buffers alongside streams that flow across their properties. This activity can prevent further degradation of water quality and has the potential to improve water quality if embraced by a substantial portion of the rural population. Enlisting residents to participate in stream and riparian restoration projects is also highly effective as an education tool. Many of the public education programs referenced in the *Key Peninsula-Gig Harbor-Islands (KGI) Watershed Characterization and Action Plan* are also referenced in the Basin Plan.

The Key Peninsula-Islands Basin is just starting the development of a community plan and development regulations to address habitat conservation have recently been adopted for all of Pierce County. Programmatic recommendations in the Key Peninsula-Islands Basin Plan are aimed at assessing the effectiveness of current programs as well as the effectiveness of surface

water management structures and impacts on water resources, through a monitoring program. The plan also recommends the implementation of a low-impact development project for the Basin. As a result, water resources are expected to achieve a greater level of protection because of increased water quality and site development compliance assurance and inspection and technical assistance and education activities, as recommended in the plan.

Overall, implementation of the Basin Plan is expected to result in a major long-term benefit to the quality of the water resource conditions within the basin. No unavoidable significant adverse impacts or cumulative adverse impacts to water resources are expected to result from the implementation of the recommendations in the Basin Plan. Short-term impacts would be minor and would last only a short period following construction.

### **No-Action Alternative**

Under the “No-Action” Alternative, stormwater would continue to be managed in the Key Peninsula-Islands Basin as it is today. County efforts would continue to focus on serious drainage complaints rather than adopting a more proactive, comprehensive approach. Periodic maintenance of ditches, culverts and other county drainage facilities by County crews would continue.

Unless other measures are identified and taken to solve existing and potential future problems not identified in the 1991 Plan, the flooding, fish passage, water quality, and riparian habitat degradation problems identified in the Basin Plan may go unsolved. Flooding problems could occur in the basin at the undersized culverts identified in the hydrologic analysis. Extensive portions of the streams in the basin could remain inaccessible to migrating salmonids due to culverts that act as fish passage barriers near the mouths of many of the streams in the basin.

Riparian habitat and water quality throughout the basin could degrade over time without the implementation of the recommended programmatic measures in the Basin Plan. Streamside vegetation loss could continue as development occurs, despite recently implemented buffer width regulations, due to vested rights of developers. The loss of streamside shade, woody debris recruitment and the accelerated input of sediment could continue to result in degraded fish habitat and degraded water quality. Without periodic water quality monitoring and stream surveys conducted as recommended in the Basin Plan, it would be difficult to assess the effectiveness of regulations and programs in protecting or improving water quality and riparian habitat.

Ongoing riparian restoration projects and fish passage barrier removal projects carried out by the Pierce Conservation District (PCD) would be expected to result in modest improvements in water quality and stream accessibility for fish over the long term. Short-term impacts and mitigation measures associated with capital facilities projects listed in the 1991 CIP are similar to those discussed under the Proposed Action.

The No-Action Alternative would result in few major long-term benefits to the quality of the water resource conditions within the basin. No mitigation has been proposed for the adverse impacts that could result from the No-Action Alternative, and over time it is expected that cumulative adverse impacts to water resources would occur.

## Fishery Resources

### Affected Environment

Fishery resources within the Key Peninsula-Islands Basin are discussed in detail in Chapter 8 of the Basin Plan.

Coho salmon, chum salmon, and cutthroat trout are likely present in all major streams in the Key Peninsula-Islands Basin, based on fieldwork observations made from October to November 2003. In 1999, the Puget Sound Chinook salmon and the bull trout were listed under the “Endangered Species Act.” Fishery resources are greatly influenced by a number of anthropogenic factors including the loss of riparian habitat, changes to the aquatic habitat, fish passage barriers, and changes in basin hydrology. Riparian health is directly influenced by the relative amount and condition of vegetated buffer along the stream. Aquatic habitat conditions are impacted by water volume, temperature, water quality, sediment movement and storage, and food resources. Barriers to fish passage prevent migratory species from entering the upper reaches of creeks. Finally, changes in basin hydrology occur with development and increasing impervious surface. As a result of development activities, less water infiltrates, resulting in more runoff and more instream flow potential, and the water that does runoff generally travels much quicker to the discharge location, yielding more peak flow.

### *Significant Impacts to Fisheries and Proposed Mitigation Measures*

#### Proposed Action

The Proposed Action recommends a list of capital improvement projects (CIP) to improve drainage, fish passage, and water quality in the basin streams. It includes recommendations to replace 27 culverts and construct 3 fish passage improvement projects. A total of 28 of the 30 projects are fish passage barriers.

The long-term effects of these projects would be a net improvement for fish passage and water quality in the basin. The culvert replacement projects at flood hazard culverts would result in stream crossings that meet current county road standards and substantially reduce the potential for road flooding in the basin. The culvert replacement projects at fish passage barrier culverts would result in a significant increase in habitat accessible to anadromous salmonids and other fish migrating upstream and downstream.

During and following construction of the proposed culvert projects, the freshly disturbed stream channel has the potential to transport additional sediment resulting from erosion processes. Erosion would be controlled through the application of BMP's. Using properly implemented and appropriate erosion control BMP's, short-term adverse impacts to fish habitat would be minor. All of the replacement culverts would be designed and constructed to meet fish passage requirements. Their installation would therefore result in a net long-term benefit to fish habitat.

The Basin Plan also includes recommendations for implementing programmatic measures to encourage private landowners to protect and improve riparian habitat and water quality. In addition, programmatic and capital improvement projects are recommended to implement floodplain acquisition and aquatic and riparian habitat protection or enhancement. Programmatic measures would help ensure new development abides by recently implemented buffer regulations, minimizing the influence of the vested right of developers. These protection and enhancement projects would be undertaken to improve fish and wildlife habitat and water quality if analyses of basin conditions show that voluntary riparian habitat and water quality protection and improvement measures are not adequately meeting basin needs. The Basin Plan identifies areas where floodplain acquisition and riparian and aquatic habitat protection or enhancement could be undertaken to improve fish and wildlife habitat and water quality. These projects would protect existing areas of high quality habitat and riparian corridor, as well as improve habitat and the riparian corridor in degraded areas. The beneficial impacts of improving the riparian corridor for water quality purposes were discussed above.

Aquatic habitat improvement and stream enhancement projects would consist of channel enhancement measures such as bank stabilization, large woody debris installation, and channel relocation (meander creation) as necessary. These projects could also include riparian vegetation planting, extending away from the streambanks for a distance of 20-40 feet. The objective of aquatic habitat improvement and stream enhancement is to create complex habitat with adequate pools and riffles in addition to instream vegetative cover in the form of large woody debris and riparian trees. Other benefits include increased shading to reduce peak water temperatures and stream bank stabilization to reduce instream sediment loads, thus improving instream water quality conditions and benefiting fishery resources.

While performing aquatic habitat improvement and stream enhancement projects, there is considerable potential for sediment delivery to streams, in the first few years following construction. Typically, when instream construction is done, flow is diverted around the construction zone. The construction zone would be isolated with upstream and downstream barriers made of sandbags in combination with membrane water barriers. Pumps would typically be employed just downstream of the upstream barrier to insure the effective dewatering of the construction zone. Instream construction is typically performed during the driest months of the year (July, August, and September) to minimize the possibility of flooding the construction area. Construction during this dry-weather period also has the least impact upon resident and migratory fish.

After earthwork is completed, additional BMP's for erosion control would be employed. For instance, jute matting, coir logs, facines, and/or hydroseeding (native wetland mix) would be used. Temporary irrigation may be employed through the summer and fall following construction to ensure a high degree of survival of grass, forbs, shrubs, and tree plantings. All of these additional BMP's are designed to minimize sediment transport. All disturbed stream bottom area would be restored to clean gravel or cobble.

Riparian planting projects differ from stream restoration projects because no disturbance actually occurs within the channel. Typical riparian planting activities include the planting of

willow stakes and containerized stock such as Sitka spruce, western hemlock, red cedar, Pacific ninebark, salmonberry, red osier dogwood, and other species. Except for the willows and dogwoods, the remaining species would be planted at or above the ordinary high water mark. As the result of the noninvasive techniques used in riparian plantings, no significant short-term impacts are expected. Over the long term, substantial benefits to fishery habitat would occur. The tree and brush canopy provides cover to reduce the frequency of high summer water temperatures. Eventually, wood would fall into the stream to provide a permanent supply of large woody debris, providing additional habitat for fish species.

No unavoidable significant adverse impacts or cumulative adverse impacts to fishery resources are expected to result from the implementation of the recommendations in the Basin Plan. Implementation of the Basin Plan would result in long-term benefits to fish habitat and habitat accessibility within the Key Peninsula-Islands Basin. Short-term impacts would be minor with mitigation and would last only a short period following construction.

### **No-Action Alternative**

Under the No-Action Alternative, removal of fish passage barriers, riparian habitat protection and improvement, and water quality protection and improvement would continue to be managed in the Key Peninsula-Islands Basin as it is today. County efforts would continue to focus on flooding and drainage complaints and large-scale water quality concerns rather than fish passage and riparian habitat problems.

Ongoing riparian restoration projects and fish passage barrier removal projects carried out by the Pierce Conservation District would be expected to result in modest improvements in water quality, fish habitat and stream accessibility over the long term. However, extensive portions of the streams in the basin could still remain inaccessible to migrating salmonids. Fish habitat and water quality throughout the basin could degrade over time without the implementation of some of the recommended programmatic measures in the Basin Plan. Streamside vegetation loss could continue as development occurs despite buffer regulations, due to vested rights of developers. The loss of streamside shade, woody debris recruitment and the accelerated addition of sediment could continue to result in degraded fish habitat. Without increased inspections, periodic water quality monitoring, and stream surveys conducted as recommended in the Basin Plan, it would be difficult to assess the effectiveness of existing programs in protecting or improving flood hazards, water quality and riparian habitat.

Short-term impacts and mitigation measures associated with capital improvement projects listed in the 1991 CIP are similar to those discussed under the Basin Plan Alternative. No unavoidable significant adverse impacts or cumulative adverse impacts to fishery resources are expected to result from the implementation of the recommendations in the Basin Plan. Implementation of the Basin Plan would result in long-term benefits to fish habitat and habitat accessibility within the Key Peninsula-Islands Basin. Short-term impacts would be minor with mitigation and would last only a short period following construction.

The No-Action Alternative would not result in any significant improvements to fishery resources within the basin and could adversely impact fishery resources by not ensuring timely

removal of fish passage barriers and protection or improvement of riparian habitat and water quality. Mitigation measures for short-term impacts associated with construction are similar to those recommended in the Basin Plan.

## Vegetation

### Affected Environment

Before the arrival of Euro-Americans, the Key Peninsula-Islands Basin was occupied by conifer forest dominated by western hemlock, western red cedar, and Douglas fir. Virtually all of the old growth forest was logged during the nineteenth and twentieth centuries. Now the basin is occupied by unvegetated surfaces and a mosaic of vegetation types including conifer forests of varying age, pasture, shrub-scrub, and non-native plantings around suburban and rural homes. The remaining forest is dominated by stands of less-than one-hundred-year-old Douglas firs, which if left undisturbed will be gradually replaced by western hemlock and western red cedar. Hardwoods are common on recently disturbed sites and in riparian areas. They include red alder, big leaf maple, and willows. Common shrub species include Douglas maple, vine maple, Indian plum, gooseberry, huckleberry, and salmonberry. Salal, sword fern, deer fern, and Oregon grape are common low growing plant species.

The predominant land use type in the basin is low-density residential and this will continue to be so in the future. The other primary current land use categories include vacant and forest-open space. Urban land uses, comprising residential, commercial, industrial, institutional, and transportation uses, currently occupy 51% of the land surface. In the future, urban uses are estimated to occupy 80% of the land surface. The existing development of the basin has resulted in loss of vegetation in forested areas and along riparian corridors. In the 2003 stream survey, 73% of the riparian corridor surveyed was in “Good” condition, 12% was in “Fair” condition and 14% was in “Poor” condition.

To control potential impacts on stream health from new development within riparian corridors of the Key Peninsula-Islands Basin, buffer width ordinances and regulations have been developed at the regional and local level. Table 9-5 of the Basin Plan provides a summary of the plans and codes that affect Key Peninsula-Islands Basin and the corresponding range in buffer widths required.

All new development would be subject to the current critical areas and resource lands regulations (including the increased buffer widths), unless a property is vested, meaning the date used to determine which development regulations apply to the property is prior to the date that the current regulations became effective. Thus, while buffer width ordinances may protect some streamside vegetation, degradation of the riparian corridors could continue as development occurs due to vested rights of some developers.

## ***Significant Impacts to Vegetation and Proposed Mitigation Measures***

### **Proposed Action**

During construction of the replacement culverts recommended in the Basin Plan, vegetation in the immediate vicinity of the projects could be adversely impacted due to the movement of equipment or materials along streambanks. Damage to vegetation during the construction period would be mitigated by post-construction plantings of native plants. It is not expected that any major components of the riparian corridor would be damaged or removed during culvert replacement. Trees would be left in place unless removal is absolutely required for construction. Using properly implemented mitigation plantings, short-term impacts to vegetation would be minor.

The Basin Plan includes recommendations for implementing programmatic and capital improvement measures to encourage private landowners to protect and improve riparian habitat, vegetation, and water quality. Programmatic measures would help ensure new development abides by recently implemented buffer regulations, minimizing the influence of the vested right of developers. These protection and enhancement projects would be conducted to improve fish and wildlife habitat and water quality if analyses of basin conditions show that voluntary riparian habitat and water quality protection and improvement measures are not adequately meeting basin needs. The Basin Plan identifies areas where property acquisition and riparian and aquatic habitat protection or enhancement could be conducted to improve fish and wildlife habitat and water quality. These projects would protect existing areas of high quality habitat and riparian corridor, as well as improve habitat and the riparian corridor in degraded areas.

Aquatic habitat improvement and stream enhancement projects would consist of channel enhancement measures such as bank stabilization, large woody debris installation, and channel relocation (meander creation) as necessary. These projects could also include riparian vegetation planting, extending away from the streambanks for a distance of 20 to 40 feet.

While performing aquatic habitat improvement and stream enhancement projects, existing, low-growing vegetation in the project areas (e.g. grasses, shrubs) may be impacted by the movement of equipment and materials. Larger vegetation such as trees would not be impacted. When feasible, existing beneficial native vegetation will be left in place and protected during projects. Additional beneficial native vegetation will be added, and non-native vegetation with little or no beneficial uses will be removed. Particular attention will be paid to removing extremely invasive non-native vegetation, such as English Ivy, Scotch Broom, and Himalayan Blackberry.

Riparian habitat improvement projects are likely to include the planting of willow stakes and containerized stock such as Sitka spruce, western hemlock, red cedar, Pacific ninebark, salmonberry, red osier dogwood, and other species. Except for the willows and dogwoods, the remaining species would be planted at or above the ordinary high water mark. As the result of

the noninvasive techniques used in riparian plantings, no significant short-term impacts are expected to existing beneficial native vegetation.

No unavoidable significant adverse impacts or cumulative adverse impacts to vegetation are expected to result from implementation of recommendations in the Basin Plan. Implementation of the Basin Plan would result in long-term benefits to vegetation within the Key Peninsula-Islands Basin. Short-term impacts would be minor with mitigation and would last only a short period following construction.

### **No-Action Alternative**

Under the No-Action Alternative, riparian habitat and water quality protection and improvement would continue to be managed in the Key Peninsula-Islands Basin as it is today. County efforts would continue to focus on flooding and drainage complaints and large-scale water quality concerns rather than vegetation loss and riparian habitat problems.

As discussed above, buffer width ordinances and regulations have been developed at the regional and local level in an effort to control potential impacts on stream health from new development within riparian corridors of the Key Peninsula-Islands Basin. However, while buffer width ordinances may protect some streamside vegetation, degradation of the riparian corridors could continue as development occurs due to vested rights of some developers. Future development in the basin will likely result in the loss of additional vegetation in forested areas and the continued replacement of native plants with non-native plants for landscaping. The loss of native plants will result in less wildlife habitat, food, and cover.

Ongoing riparian restoration projects carried out by the Pierce Conservation District is expected to result in modest improvements to water quality and riparian vegetation over the long term. However, without the implementation of the stream enhancement, land acquisition and other programmatic measures and capital improvement projects recommended in the Basin Plan, it is expected that overall vegetation conditions may degrade in the basin.

Short-term impacts and mitigation measures associated with capital facilities projects listed in the 1991 Plan are similar to those discussed under the Basin Plan Alternative.

The No-Action Alternative would not result in any improvements to vegetation within the basin and could adversely impact vegetation by not ensuring protection or improvement of riparian habitat and water quality.

## Wildlife

### **Affected Environment**

Most of the original fauna remains, although generally reduced in abundance except for those species that can tolerate or benefit from close association with humans and habitat fragmentation. Typical mammals inhabiting the Basin include black bear, blacktail deer, coyote, raccoon, red fox, longtail weasel, deer mouse, and shrews. Common birds of the forest canopy include several species of flycatchers and wood warblers, black-capped and chestnut-backed chickadees, and red-breasted nuthatches. Song sparrows, fox sparrows, spotted towhees, American robins, and Swainson's thrushes are found in the shrub layer. House sparrows, house finches, European starlings, Brewer's blackbirds, and Northwestern crows are found in suburban areas.

### ***Significant Impacts to Wildlife and Proposed Mitigation Measures***

#### **Proposed Alternative**

During culvert replacement activities, the movement of equipment or materials and the associated disturbances to the water, soils, and vegetation could temporarily impact wildlife in the immediate vicinity of the construction activities. The impacts to water, soils, and vegetation will be mitigated as described in the water resources, fishery resources, and vegetation sections above. The short-term adverse impacts to wildlife would be minor as a result of these mitigation efforts.

Protection and enhancement programs recommended in the Basin Plan would be conducted to improve fish and wildlife habitat and water quality. These projects and programs would protect existing areas of high quality habitat and riparian corridor, as well as improve habitat and the riparian corridor in degraded areas. Aquatic habitat improvement and stream enhancement projects would consist of channel enhancement measures such as bank stabilization, large woody debris installation, and channel relocation (meander creation) as necessary. These projects could also include riparian vegetation planting, extending away from the streambanks for a distance of 20-40 feet.

Where property is acquired to protect existing high quality habitat and riparian corridor, long-term impacts to wildlife will generally be beneficial. Short-term adverse impacts are generally associated with construction activities during aquatic habitat improvement, stream enhancement, and riparian corridor improvement projects. During construction activities, wildlife may be temporarily displaced, but the impact is expected to be minor because construction activities would generally not last more than several days. Removal of invasive and non-native plants species may also result in temporary displacement of wildlife species due to loss of cover. This would be a short-term adverse impact to wildlife. Beneficial, long-term impacts for wildlife would occur as a result of the habitat improvement and stream enhancement projects. Removal of non-native vegetation and planting of beneficial native vegetation will provide wildlife with more food, cover, and habitat in the long-term.

No unavoidable significant adverse impacts or cumulative adverse impacts to wildlife are expected to result from the implementation of the recommendations in the Basin Plan. Implementation of the Basin Plan would result in long-term benefits to wildlife within the Key Peninsula-Islands Basin. Short-term impacts would be minor with proper mitigation efforts and would last only a short period following construction.

### **No-Action Alternative**

Under the “No-Action” Alternative, riparian habitat and water quality protection and improvement would continue to be managed in the Key Peninsula-Islands Basin as it is today. County efforts would continue to focus on flooding and drainage complaints and large-scale water quality concerns rather than concerns to wildlife and wildlife habitat including vegetation loss and riparian habitat problems.

Future development in the basin will likely result in the loss of additional vegetation in forested areas, and the continued replacement of native plants with non-native plants used for landscaping. The loss of native plants will result in less wildlife habitat, food, and cover.

Ongoing riparian restoration projects carried out by the Pierce Conservation District would be expected to result in modest improvements in water quality and riparian vegetation over the long term. However, without the implementation of the stream enhancement, land acquisition and other programmatic measures and capital improvement projects recommended in the Basin Plan, it is expected that overall vegetation conditions may degrade in the basin which could reduce wildlife populations and the variety of species living in the basin over time.

Short-term impacts and mitigation measures associated with capital improvement projects listed in the 1991 Plan are similar to those discussed under the Basin Plan Alternative. The No-Action Alternative would not result in any improvements to vegetation or wildlife within the basin and could adversely impact vegetation and thus wildlife by not ensuring protection or improvement of riparian habitat and water quality.

## **Land Use**

### **Affected Environment**

The 2000 census recorded the population of the Key Peninsula-Islands Basin as approximately 20,856. The predominant land use type in the basin is low-density residential use and this will continue to be so in the future. Urban land uses, comprising residential, commercial, industrial, institutional, and transportation uses, currently occupy 51% of the land surface. In the future, urban uses are expected to occupy 80% of the land surface. Present and future land use types are shown in Tables 4-12 and 4-13 of the Basin Plan. These data were used to compute the percentages of impervious surface in each subbasin.

The *Comprehensive Plan for Pierce County Washington* (Comprehensive Plan) contains land use and planning policies for Pierce County. The following planning and stormwater management directives are derived from the policies in the Plan:

- Provide urban level facilities and services only within the designated Urban Growth Area.
- Maintain the adopted level of service standard (LOS) for stormwater facilities. According to the Capital Facilities Element of the Comprehensive Plan, stormwater conveyance is to be designed for a 25-year, 24-hour design storm. Holding facilities for runoff are to be designed for a 100-year, 24-hour design storm or a 100-year, 7-day design storm, whichever result in a larger facility. Water quality treatment is to be designed for a 6-month, 24-hour design storm. Stormwater runoff projections used for forecasting future stormwater facility and identifying non-structural alternatives in the basin plans are based on the LOS in the Comprehensive Plan.
- Maintain compatibility between facilities and adjacent land uses.
- Foster and retain community character.
- Nonstructural measures should be preferred over structural measures for stormwater management.
- Involve the public and others with a stake in the outcome in water quality and stormwater management planning.
- Use of natural drainage systems for runoff is preferred over construction of facilities.
- Manage and plan water resources on a watershed basis.
- Support community education to conserve water resources.
- Provide for buffers of undisturbed vegetation in all new facility developments next to streams, ponds, lakes and Puget Sound.
- Pursue public acquisition of critical fish and wildlife habitat areas.
- Map all flood hazard areas.
- Maintain existing flood control structures on Pierce County rivers and streams.
- Evaluate the effectiveness of existing requirements for on-site stormwater retention and detention and revise where flooding issues are not adequately addressed.
- Pursue public acquisition of flood hazard areas.
- Protect, conserve and enhance the historic and cultural heritage of Pierce County.
- Upgrade and maintain existing capital facilities.
- Prohibit new uses that attract birds or waterfowl in the clear zone and Accident Potential Zones of McChord AFB.
- Develop and implement Community Plans

## ***Impacts to Land Use and Proposed Mitigation Measures***

### **Proposed Action**

Implementation of the Basin Plan would not be expected to significantly affect land use in the basin. The recommendations of the Basin Plan are consistent with or do not interfere with the planning and stormwater management directives from the Comprehensive Plan listed above. No unavoidable significant adverse impacts or cumulative adverse impacts to land use are expected to result from the implementation of the recommendations in the Basin Plan.

### **No-Action Alternative**

Implementation of the No-Action Alternative would not be expected to significantly affect land use in the basin. However, there is an inherent inconsistency of the action recommended in the 1991 Plan (“No-Action”) because the document was prepared before the County adopted its current Comprehensive Plan. The “No-Action” Alternative would continue that inherent inconsistency.

## **Aesthetic, Historic and Cultural Resources**

### **Affected Environment**

The Key Peninsula-Islands Basin is a highly scenic area with views of Mt. Rainier, the Tacoma Narrows, the Olympic Mountains, and Puget Sound. Numerous streams, lakes, and forested areas in the basin also provide aesthetically pleasing views. The basin includes a number of properties with views, and the appreciation of natural aesthetics is often reflected in the higher property values for areas with scenic views or adjacent to natural areas.

## ***Significant Impacts to Aesthetic, Historic and Cultural Resources and Proposed Mitigation Measures***

### **Proposed Action**

The Basin Plan components that involve construction activities, such as the culvert replacement projects, may cause short-term aesthetic impacts, but impacts are not expected to be significant. Long-term beneficial impacts would result from stream and riparian habitat restoration activities that would add vegetation alongside water bodies and ultimately improve the aesthetic views of those areas.

None of the recommended Basin Plan components are expected to adversely impact known cultural or historical resources in the basin. However, there is a potential to encounter historic or cultural resources during construction. If historic or cultural resources are discovered during construction activities, the County would immediately consult with the OAH in Olympia and other officials regarding appropriate measures to implement. These measures require additional investigations of historic and cultural resources that could be affected on the project site and identification of appropriate mitigation measures prior to any additional work that could adversely affect cultural resources.

No unavoidable significant adverse impacts or cumulative adverse impacts to aesthetic, historic, or cultural resources are expected to result from the implementation of the recommendations in the Basin Plan. Implementation of the Basin Plan would result in long-term benefits to aesthetic qualities of the Key Peninsula-Islands Basin by improving riparian corridor conditions in degraded areas.

### **No-Action Alternative**

Implementation of the No-Action Alternative would not be expected to significantly affect aesthetic, historic, or cultural resources in the basin. If any cultural resources were discovered during construction activities, the County would immediately consult with the OAHP in Olympia and other appropriate officials regarding appropriate measures.

## **Public Services, Utilities, Transportation, and Recreation**

### **Affected Environment**

#### **Public Services**

All typical public services are available in the Key Peninsula-Islands Basin, including fire protection, police protection, health care, surface water management, and schools.

#### **Utilities**

Electricity, telephone, surface water, and refuse service are available throughout the Key Peninsula-Islands Basin. Due to the largely rural nature of the basin, many areas rely on private wells and septic systems. Drinking water utilities rely primarily on groundwater resources.

#### **Transportation**

Highway 302, off of State Route 16 (SR 16) is the only major highway in the Key Peninsula-Islands Basin. Highway 302 stems from SR 16, crossing Burley Lagoon and enters the Key Peninsula-Islands Basin in the northeast corner of the peninsula. This highway route runs west across the peninsula the basin to Rocky Bay. It is a four-lane, limited access highway. Aside from Highway 302, the surface transportation network in the Key Peninsula-Islands Basin is mostly comprised of two-lane county roads, the longest of which is Key Peninsula Highway that runs north-south along the peninsula.

In March 2002 the Washington State Legislature enacted legislation that allows a second bridge across the Tacoma Narrows to be built, increasing the capacity of SR 16 to carry traffic between Tacoma and the Key Peninsula-Islands Basin. The existing four-lane bridge will be reconfigured to provide two general purpose lanes and an HOV lane for westbound traffic, and the new bridge will provide two general purpose lanes and an HOV lane for eastbound traffic. The project is currently under construction by the Washington Department of Transportation plans and is expected to open to the public in 2007.

**Recreation**

There are a number of parks, marinas, and other recreational areas throughout the Basin. Penrose Point State Park and Joemma Beach State Park are each about 100 acres with marine access and camping facilities available. There are a number of lakes throughout the Basin, which serve as recreational areas for swimming, fishing and camping activities. Fox Island (approximately five square miles) and Anderson Island (approximately 8.1 square miles) are both primarily rural communities with a number of marinas, parks, and golf courses.

***Significant Impacts to Public Services, Utilities, Transportation, and Recreation and Proposed Mitigation Measures*****Proposed Action**

Implementation of some identified CIPs, particularly culvert replacement projects, would require construction alongside the roadway and would have short-term adverse impacts to transportation and public safety during the construction period. Utilities could potentially be impacted during the construction period, particularly if there are buried utility lines along roadways and overhead lines near where construction equipment would be located. Local roads may be closed for limited periods of time during construction and traffic detoured along other routes. Road closures could result in potential delays for emergency vehicles. Road construction at most culvert replacement sites is not expected to last for more than a few days, although some of the culverts located deep below the roadway may require a more lengthy construction period. Short-term construction-related impacts would be mitigated according to standard road construction practices and would include use of flaggers to direct traffic along detours during heavy traffic periods and notices to local utility customers who might be affected by construction impacts to utility lines. Long-term public safety would be enhanced as a result of these projects. The potential for road flooding within the basin would be substantially reduced.

No unavoidable significant adverse impacts or cumulative adverse impacts to public services and utilities are expected to result from the implementation of the recommendations in the Basin Plan. Implementation of the Basin Plan would result in long-term benefits to the surface water management program, as well as to public safety in the Key Peninsula-Islands Basin by reducing the risk of roadway flooding.

**No-Action Alternative**

Under the No-Action Alternative, stormwater would continue to be managed in the Key Peninsula-Islands Basin as it is today. County efforts would continue to focus on flooding and drainage complaints rather than assuming a more proactive, comprehensive approach. Periodic maintenance of ditches, culverts and other county drainage facilities by County crews would continue.

Unless other measures are identified and taken to solve existing and potential future problems not identified in the 1991 Plan, the potential flooding problems identified in the Basin Plan

may go unsolved. Flooding problems could occur in the basin at the undersized culvert locations identified in the Basin Plan analysis. Long-term public safety could deteriorate as a result of these potential flooding problems.

## Soils

### **Affected Environment**

The Key Peninsula-Islands Basin is located on a peninsula extending southward into Puget Sound. It is bounded on the east by Carr Inlet and Henderson Bay, on the west by Case Inlet, and on the south by Nisqually Reach. Several drainage divides that are located north of the Pierce/Kitsap County line within Kitsap County form the northern boundary of the basin. Much of the land surface of the peninsula lies between two and or three hundred feet above sea level and is characterized by a terrain of rolling, rather flat-topped hills and ridges. Bluffs drop to the waters of Puget Sound on all three sides of the peninsula. The steepest bluffs (45-70% slope) are found on along the bluffs at the edge of the peninsula and on the islands. Surface soils on Key Peninsula are primarily classified as the Harstine Association. The Harstine Association soils are moderately well-drained soils that have formed in glacial till and have a moderate erosion hazard.

### ***Significant Impacts to Soils and Proposed Mitigation Measures***

#### **Proposed Alternative**

Many of the proposed CIPs in the Basin Plan could have short-term construction-related impacts on soils. Culvert replacement would disturb the soils on streambanks and stream bottoms. Stream restoration, stream bank stabilization and riparian revegetation projects would also disturb soils in areas within and adjacent to construction activities. Where these disturbed areas come in contact with flowing waters, sediment would be mobilized and quickly carried downstream, temporarily increasing turbidity and reducing water quality. Subsequent deposition of sediment could also harm fish habitat. The proposed CIPs are generally intended to reduce long-term erosion and other negative impacts to soils due to stormwater runoff. No long-term adverse impacts are anticipated from the Basin Plan Alternative. Long-term positive impacts may occur from reduced erosion due to stream bank stabilization and riparian revegetation projects.

Standard erosion control measures would be implemented to avoid serious sedimentation problems. Each construction project will be required to meet County construction and erosion control requirements, as well as applicable state and federal requirements. For instance, those projects taking place within a stream will require compliance with the State Hydraulics Code. The standard requirement for control of erosion and other construction-related pollutants, such as fuels and lubricants, ensures that the impacts to soils will be short-term and insignificant. Work adjacent to or within streams will typically be limited to the summertime low-flow periods, and thus will subsequently take place during periods of less intense and frequent rainfall, reducing the likelihood of significant sediment transport during construction activity. Standard erosion control measures such as silt fencing, coverage of exposed earth, and

permanent seeding of disturbed areas following construction will further reduce temporary sediment impacts.

No unavoidable, significant adverse impacts or cumulative adverse impacts to soils are expected to result from the implementation of the recommendations in the Basin Plan. Implementation of the Basin Plan would result in long-term benefits to soils in the Key Peninsula-Islands Basin by reducing erosion.

**No-Action Alternative**

No unavoidable significant adverse impacts or cumulative adverse impacts to soils are expected to result from the No-Action Alternative.

**RESPONSE TO COMMENTS**

This section of the Final SEIS documents the written comment submitted within the 30-day comment period for the Draft SEIS, from January 19, 2006 to February 21, 2006.

Comment 1 from Jim Bosch, Vaughn, Key Peninsula.. Submitted as an email on February 24, 2006.

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02/24/2006 01:42 PM

To [bsmolko@co.pierce.wa.us](mailto:bsmolko@co.pierce.wa.us)  
cc [ela\\_whelan@urscorp.com](mailto:ela_whelan@urscorp.com)

Subject Vaughn Creek

Barbara,

I have an appointment on March 7, 2006, with Ela Whelan to meet with me to discuss and view my concerns with areas VA01, VA02 and VA03.

Briefly, these concerns are:

- 1) Location of the monitoring site
- 2) Location of the stream gauge
- 3) Location of culverts not mentioned in the report
- 4) Conditions of aquatic and riparian habitat (ratings) in the above mentioned areas
- 5) Fish barrier
- 6) Potential flooding

Hopefully, her visit will correct the misinformation in this study.

Jim Bosch  
16714 Olson Dr KPN  
Phone: 253-884-3320

**Response to Comment 1** from Jim Bosch regarding Vaughn Creek tributary drainage areas and corresponding stream reaches VA1, VA2, and VA3.

1-1 and 1-2. The water quality monitoring site and the stream gauge location on Figure 4-15 was in the wrong location. Figure 4-15 has been changed to reflect the accurate location.

1-3 The set of twin culverts at McFadden Road were not included in Chapter 4 because flooding problems had not been reported. A culvert replacement project will be included in the Basin Plan recommendations. The culvert will also be identified in Chapter 4 as a potential fish passage barrier.

1-4 URS staff reevaluated stream reaches VA1, VA2, and VA3 on March 7, 2006 and assigned one more point to four criteria out of 14 total criteria in the stream reach assessment. The criteria include Substrate Composition, Canopy Cover, Structural Diversity and Invasive Species. This adjustment changes the rating of Reach 2 to "Fair" for both aquatic and riparian habitat. VA2 is a complex reach with a great deal of good habitat. However, within this reach, also exists armoring of the stream bank, a reduced buffer area, invasive species, and dumping of debris in the buffer area. These conditions lower habitat ratings.

Reach 3 received a rating of "Fair", even though the canopy and substrate composition appeared to be of lesser quality than Reach 2, because Reach 3 is "Palustrine" and is rated with different criteria than Reach 2, classified as "moderate gradient/mixed control". Wetland channels, beaver complexes or sloughs characterize the Palustrine. Velocity is generally slow, substrates are composed of fine sediment or organic matter, and channel morphology is sinuous or irregular and dominated by pools or glides. Reach 2, Moderate Gradient Mixed Control, has channels dominated by debris transport with moderate to high stream power. Large woody debris is important in forming pools and storing sediment, thus substrates and bedforms are highly variable. Off-channel habitats may be present, but are not abundant.

See Appendix D, Stream Survey Methods Ecosystem Diagnosis and Treatment (EDT), and Appendix E, Stream Survey Results.

1-5 Fish barriers. See 1-3 above.

1-6 See 1-3 above.

Comment 2 submitted as an email

**From:** <Jordanruthseto@aol.com>  
**To:** <BSMOLKO@co.pierce.wa.us>  
**Date:** Tue, Feb 21, 2006 11:32 AM  
**Subject:** eis input

Dear Barbara; Here are a few comments for the record in the EIS of the Basin SWMP.  
 Thanks, Peter Seto

For the Record : EIS Basin Plan Public Review Comments from Peter Seto, School House Creek Stream Steward

Sirs; Please consider the following comments on the Anderson Island Executive Summary and the attendant tables and maps attached thereto. While some field work was done to support the findings of this Plan, it was limited to a walk-through. The stream has been the subject of ongoing study and restoration by Islander for many years. There are established runs of sea-run cutthroat Coho and Chum salmon in the stream. Fry are found in all stream sections from AI-09 to salt water. The culverts up-stream to CR-08 are passable by fish. Careful placement of rocks to keep pooling water in the culverts allows this.

CR-08 is too steep to create a durable pool backing into the culvert with our limited reasources. The stumps observed in the stream were placed there to attempt to create a pool in CR-08. CR-09 was blocked to create a pool which is stocked annually to allow fry to grow in the upper stream. Please leave this "culvert" entirely alone.

I ask that all of the changes, modifications and "enhancements" be removed from the list except the addition of a step-pool at CR-08 to allow up-stream passage for salmon into stream section AI09. Work in the stream bed, in the riparian area, and under roadways will inevitably damage the existing salmon population. The flooding hazard at Oro Bay Rd at Ekenstam-Johnson Rd is of marginal significance. I have observed water flow in the roadway twice in the past five years; always during exceptionally heavy rains. No structures can or will be affected by high water, and the flat topography will limit the effectiveness of any culvert redesign. Costs to the stream habitat will far outweigh any nominal benefit to the wetland above and below this crossing. Further, "restoration" of the riparian vegetation is undesirable because the existing tangled blackberry provides both shade and cover from avian predators for the fry living in this section. Please leave this riparian area and stream to regenerate through the normal secession of vegetation. Please confine any work done in the stream to correcting the negative effects of human road-building at CR-08.

I recommend monies spent on salmon restoration be used to enhance habitat in the brackish Oro Bay estuary where young salmon are pounded by Herron and Kingfisher predation. Both riparian and aquatic vegetative cover are missing which would protect fingerling by providing habitat. Large schools of Chum and Coho are observable under

- 1.
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the floats of docks in the bay, but predation is intense here as well. I believe the restoration of *Zostera* or *Phylospadix* grasses in the bay is critical to enhance the salmonid population in the stream.

At a minimum I recommend the placement of root balls and tree trunks in the near shore waters to give protection to the fish. Additionally, public moorings placed in the bay and a sign encouraging no anchoring in the north portion would end the “sterilization” of the bottom by the large number of visiting boats in the summer. Anchor rodes inevitably strip thousands of square feet of vegetation from the bottom as the boats swing to the tide. Please consider these alternatives to those considered in the Basin study. This bay was a fertile and productive environment prior to the siltation and sterilization by human activity killed it. Islanders remember the herring spawning noise keeping them up in the summer nights. This is a priority for the enhancement of salmonids in the stream in question. Thank you, Peter Seto

## Response to Comment 2

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2-1 Thank you for sharing your knowledge of the creek. Your information on salmonid use of Schoolhouse Creek has been added to Chapter 4, Schoolhouse Creek, Anderson Island (AI). See Page 4-71.

2-2 The recommended Basin Plan contains the following projects for Anderson Island’s Schoolhouse Creek.

AI-CR02, culvert replacement at lower Eckenstam Johnson Road crossing

AI-CR03, culvert replacement at Oro Bay Road crossing

AI-RST04, stream restoration in Reach 04

AI- CR08, culvert replacement at upper Eckenstam Johnson Road crossing

AI – WTRST04, wetland restoration in Reach 04

AI – CR09, culvert replacement at logging road north of 108<sup>th</sup>

Culverts AI-CR02, 03, and CR08 are barriers to fish passage according to the Pierce Conservation District’s (Conservation District) Key Peninsula Fish Passage Database, 2000. CR-02 is an 18-inch precast concrete culvert that is submerged at high tide. On outgoing tides a whirlpool upstream obstructs fish passage. CR-02 is passable on incoming tides. Level B analysis is needed. CR-03 consists of two six-inch corrugated steel culverts with 1.5 and 1.2 percent slopes. CR-08 consists of two five-inch pre-cast concrete culverts, with a rock weir creating backwater into the pipe. The database suggests that a Level B analysis of the culvert is needed. None of the culverts meet the Washington State Department of Fish and Wildlife (WDFW) fish passage standards.

Other conditions exist that argue for replacing the culverts listed. Flow projections indicate a future need for AI-CR02 and AI-CR03 to minimize future flood hazards and to bring the culverts current with design standards. Culvert AI-CR09 remains in the Basin Plan as a low-priority recommended project. Prior to undertaking replacement of any the culverts, detailed analysis of engineering and fish passage factors will occur. However, deleting any of the

projects at this time removes opportunity to consider objectives, alternatives, and community preferences in depth.

2-3 The proposed projects will enhance fish habitat. It is unlawful for work in streambeds and riparian areas damage existing fish populations. Procedures exist to avoid or mitigate damages that would otherwise be unavoidable. For example, alternate stream channels can be built and used during instream work. Fish can be captured and moved to a protected location during construction. These and other measures are used to avoid adverse impacts to fish. Usually they are identified by project teams as alternatives develop and are documented in project-specific environmental review.

2-4 The Basin Plan recommends projects to address future flooding and storm drainage issues in addition to solving existing problems. Most of the capital improvement projects and non-structural measures are not intended to be undertaken immediately, but over a ten years or more.

2-5 Restoration of riparian vegetation does not necessarily mean clearing the riparian area of all vegetation and starting over. Sometimes restoring riparian vegetation means adding conifers to the mix of near stream vegetation. Over time, the conifers grow and shade ever-increasing areas around them. Many invasive plants such as Himalayan blackberries and reed canary grass cannot thrive or often survive in a shaded location. Invasive vegetation such as Himalayan blackberries can contribute to high fecal coliform loads because they provide habitat for nutria, rats, mice, and other rodents. When dieback occurs in autumn, decaying invasive vegetation in the stream consumes dissolved oxygen needed by aquatic life and decreases pH.

2-6 Comment acknowledged. Nearshore restoration is a critical need for the long-term sustainability of Puget Sound. This Basin Plan deals primarily with upland, freshwater issues. We have forwarded your suggestion to the Puget Sound Nearshore Restoration Group.

*The Key Peninsula, Gig Harbor, and Islands Watershed Nearshore Salmon Habitat Assessment, July 2003*, reports that although none of Oro Bay contains eel grass, high quality salmon habitat exists at the mouth of Schoolhouse Creek, nearshore habitat quality is rated as high. To the east, nearshore habitat quality is rated as medium. Nearshore habitat quality on the west and south sides of Oro Bay is rated as poor; however, the assessment does not describe why it is poor.

## Distribution List

### Draft Supplemental Environmental Impact Statement (Draft SEIS)

The Draft SEIS for the Key Peninsula-Islands Basin Plan was included in the Basin Plan and distributed with all copies of the Basin Plan. Copies of the Basin Plan were distributed to interested County Councilmember Terry Lee, the Pierce County Planning Commission, Washington State Department of Ecology, Key Peninsula-Islands Basin residents, the, Federal and State agencies with jurisdiction over Basin Plan components, Pierce County Water Programs, Key Peninsula-Gig Harbor-Islands Watershed Committee, Pierce Conservation District, Kitsap County, Pierce County Planning and Land Services – Advance Planning, Pierce County Storm Drainage and Surface Water Management Advisory Board, and members of the public who requested copies. Copies of the Basin Plan and Draft SEIS were sent to the following branches of the Pierce County Library System: Peninsula Library, Key Center Library, and Anderson Island Library. The Draft SEIS was also posted at the following website: [www.piercecountywa.org/kibasin](http://www.piercecountywa.org/kibasin).

### Notice of Availability

Notice of Availability of the Draft SEIS was published in the Peninsula Gateway, the official publication of record for Pierce County. Notice of Availability of the Final Supplemental Environmental Impact Statement (Final SEIS) will also be published in the official publication of record. Notice of Availability of the Draft SEIS and Notice of Availability of the Final SEIS were mailed to agencies, individuals, and other interested parties set out in the mailing list below. Names marked with an asterisk were sent copies of the Basin Plan and FSEIS.

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 Carson Katherine M; Longbranch WA  
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 Dalton Robert A Sr; Longbranch WA  
 Dana Clair; Lakebay WA  
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 Davies Esther H; Gig Harbor WA  
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 Mc Colgan Walter T; Port Orchard WA  
 Mc Cullough Rose K Ttee; Gig Harbor WA  
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 Plaines IL  
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 WA  
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 Niemann Christopher S; Lakebay WA  
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 Niemann Nicole J; Vaughn WA  
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 Paulik Steven J; Gig Harbor WA  
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 Payne Gary L & Michelle M; Buckley WA  
 Payne Robert L & Theresa; Puyallup WA  
 Payton Norman E; Puyallup WA  
 Payton Paul T & P L Newcomb; Lakebay WA  
 Pazzaglia Lance E; Lakebay WA  
 Pearson Daniels & Miller Etal; Tukwila WA  
 Pedee David M; Tacoma WA  
 Pedersen Beverly H; Lakebay WA  
 Peichoto George P & Barbara; Port Orchard WA  
 Peninsula Light Co; Gig Harbor WA  
 Peninsula School Dist #401; Gig Harbor WA  
 Penz David L; Poulsbo WA  
 Peot Bob & Scott Emry; Sumner WA  
 Perrone Richard A; Gig Harbor WA  
 Perrycook Jay A & Tahirih A; Gig Harbor WA  
 Pete David E; Seattle WA  
 Peterson Dianne L; Tacoma WA  
 Peterson Gene C; Lakebay WA  
 Pflugrad Jody M; Lakebay WA  
 Pham Theman & Tuy Nguyen; Tacoma WA  
 Phipps Richard W; Allyn WA  
 Pierce Jimmy W & Patricia J; Gig Harbor WA  
 Pike Raymond W & Florence Capone; Gig Harbor WA  
 Pinder Eric; Lakebay WA  
 Pinkham Lucille T Ttee; Long Beach CA  
 Pitt Allen D; Longbranch WA  
 Poes Taylor Bay Estates; University Place WA  
 Pomeroy Stuart J; Vancouver WA  
 Porad Bruce J & Carlana J; Gig Harbor WA  
 Potter Dale E & Michele G; Tacoma WA  
 Presbytery Of Olympia; Lakewood WA  
 Preston Steven P & Linda L; Edmonds WA  
 Purdy Investments Llc; Gig Harbor WA  
 Purdy Shopping Center Llc; Gig Harbor WA  
 Quinlan Thomas & Mary K; Gig Harbor WA  
 Radcliffe Family L P; Lakebay WA  
 Ramsdell Dale D; Lakebay WA  
 Randall Gene N & Lillian J; Gig Harbor WA  
 Rawlings Douglas R; Lakebay WA  
 Raymond Richard S & Suzanne M Etal; Port Orchard WA  
 Reeder Geraldine C; Lakebay WA

Reese Robert P Jr & Katherine L; Lakebay WA  
 Regina Bates Trustee; Port Orchard WA  
 Reichard Scott & Barbara Schoos; Longbranch WA  
 Reinke Clifford & Ona; Lakebay WA  
 Reynolds A Robert & Edith; Tacoma WA  
 Rhoads Shirlee M; Gig Harbor WA  
 Richardson Donald & Jessie A; Gig Harbor WA  
 Richardson March G & Loretta ; Longbranch WA  
 Rikansrud John E & Sharon L; Longbranch WA  
 Rikansrud Sharon; Longbranch WA  
 Riviera Community Club; Anderson Island WA  
 Roach Nokel D & Dee V; Lakebay WA  
 Robertson Janet C; Gig Harbor WA  
 Robertson Roger & Peggy; Longbranch WA  
 Robinson Debra F; Republic WA  
 Robinson Ronald & Della; Gig Harbor WA  
 Robinson Russell T & Danna R; Gig Harbor WA  
 Roddy Kurt A & Lisa R; Gig Harbor WA  
 Roderick David M; Tacoma WA  
 Roderick Phillip E; Olympia WA  
 Roe James S & Anna; Tacoma WA  
 Rogers William E; Seattle WA  
 Rolco Company; Seattle WA  
 Ronepad; Wauna WA  
 Rortvedt Gary & Kathy W; Lakebay WA  
 Rose Donald G; Lakebay Wash  
 Ross Michael L; Gig Harbor WA  
 Rossa Eric F & Paula M; Vaughn WA  
 Rufer L L/T S & E A Mann; Gig Harbor WA  
 Runkel David A; Federal Way WA  
 Rutherford Randall R; Port Orchard WA  
 Rutz Brian M; Gig Harbor WA  
 Ryan Hanh T; Jacksonville Fl  
 Saathoff Neldo; Lakebay WA  
 Salatino Angela M; Wauna WA  
 Salazer Heriberto R & B R Baily; Tukwila WA  
 Saldana Carlos F & Gloria M; Lakebay WA  
 Salscheider Douglas J & Bette D; Lakebay WA  
 Sanbeck Vernetta; University Place WA  
 Sanders Richard R & Teresa L; Vaughn WA  
 Sandvig Stephen E; Kingshill Vi  
 Sarver Michael L & Maureen O; Belfair WA  
 Sater Robert & Helen Etal; University Place WA  
 Sauro Robert L; Gig Harbor WA  
 Sawyer Michael S; Lakebay WA  
 Saxer Theodore; Lakebay WA  
 Saxon Kathleen L; Cherry Valley CA  
 Saxon Larry E Etal; Puyallup WA  
 Schafer Dean W & Patricia L; Vaughn WA  
 Schierman Victor G; Wauna WA  
 Schlag Cristy A; Longbranch WA  
 Schmidt Heinz & Alice Rt; Pleasanton CA  
 Schmidt Henry & Peggy D; Longbranch WA  
 Schmitz Gary S & Robin M; Port Orchard WA  
 Schneider David M & Susan M; Gig Harbor WA  
 Schwaiger Deanna M; Gig Harbor WA  
 Scott Danny Lee & Traci M; Vaughn WA  
 Scott John P; Lakebay WA  
 Seeley Le Roy & Lois L; Longbranch WA  
 Seelhoff Richard K & Cheryl L; Gig Harbor WA  
 Semon Richard L & Andrea; Everett WA  
 \*Seto, Paul; Anderson Island WA  
 Severtsen Lydia K; Gig Harbor WA  
 Sheppard S Gordon; Anderson Island WA  
 Siburg Jim H Jr & Jan M; Lakebay WA  
 Siefert Karen; Maple Valley WA  
 Silverbow Farm Llc; Gig Harbor WA  
 Sims Ralph D; Vaughn WA  
 Singer Henry J & Arleita M; Anderson Island WA  
 Skaggs Sharon L; Lakebay WA  
 Skahan Helen Etal; Gig Harbor WA  
 Skladany Trent J & Sherri R; Burley WA  
 Skrivanich Michael P & K Michelle; Wauna WA  
 Slater Nathan D Etal; Home WA  
 Slavic Christian Center; Tacoma WA  
 Sly John V & Karoline A; Gig Harbor WA

Smith Bradley D & Robynn E; Gig Harbor WA  
 Smith Delores M; Longbranch WA  
 Smith Julian & Johanna; Tacoma WA  
 Smith Michael A & Melanie J; Gig Harbor WA  
 Snow Randall L & Nichole M; Gig Harbor WA  
 Sohl Faith V; Seattle WA  
 Sojak Clem & Maude M; Renton WA  
 Solberg James; Home WA  
 Somerville David J; Fortuna CA  
 Sorsdahl William R & Carol J; Vaughn WA  
 Soto Edward L & Linda K; Yakima WA  
 Souers Orrin & Therese M; Auburn WA  
 Spadoni Brothers Inc; Gig Harbor WA  
 Sprague Victor & Vicky Crouse; Gig Harbor WA  
 Squire Li Roger N; Denver CO  
 St of Wa Parks & Rec Comm; Olympia WA  
 St of Wash Dept Of Trans; Olympia WA  
 St of Wash Fisheries Dept; Olympia WA  
 Stacy Gregory & Peggy; Lakebay WA  
 Stacy Robert & Bonnie; Lakebay WA  
 Stainbrook Darren V & Christine; Gig Harbor WA  
 Stalder William G; Hoodspport WA  
 Stanford Austin H & Viola G; Shoreline WA  
 Stang Jeffrey L; Gig Harbor WA  
 Stanley Dylan T; Lakebay WA  
 State Of Washington; Olympia WA  
 Stencil Barry & Erin; Vaughn WA  
 Stencil Douglas H & Norma; Lakebay WA  
 Stevica Ivan; Seattle WA  
 Steward Helen L; Lakebay WA  
 Stewart Mark E; Lakebay WA  
 Stiner Bruce R & Annette C; Lakebay WA  
 Stiner Jane Louise; Gig Harbor WA  
 Stokke Barry M; Gig Harbor WA  
 Stracke Morrine; Tacoma WA  
 Sullivan Terrance S & Jean G; Lakebay WA  
 Summerfelt Donald A & Marjorie A; Lakebay WA  
 Sumner Lilly V; Lakebay WA  
 Swanson Joel D & Betty A Ttee; Studio City CA  
 Swanson Martha A; Gig Harbor WA  
 Sweet Matthew D; Gig Harbor WA  
 Swenning Shane W & Lisa M; Longbranch WA  
 Swinney Stephen E; Gig Harbor WA  
 Sykes Eugene E & Jacqueline; Gig Harbor WA  
 Tachell Barbara B; Burien WA  
 Tallman James O & Dian M; Gig Harbor WA  
 Talmo Inc; Gig Harbor WA  
 Tarabochia Nick J Jr; Gig Harbor WA  
 Tatman John; Tacoma WA  
 Taylor Bay Beach Club Inc; Longbranch WA  
 Taylor Timothy L & Cindy R; Longbranch WA  
 Telephone Utilities Of Wash; Monroe La  
 Theroux Gregory V; Oregon City Or  
 Thomas Elgin R; Vaughn WA  
 Thomas Leslie L; Tacoma WA  
 Thomas Melinda C; Lakebay WA  
 Thomson Kelly R; Gig Harbor WA  
 Thomson Marilyn M; Gig Harbor WA  
 Throm Harold R; Anderson Island WA  
 Tobin Carol L; Burley WA  
 Tobin Mark P & Kathleen A; Longbranch WA  
 Todhunter Robert; Lakebay WA  
 Torres Lois I; Vaughn WA  
 Tossavainen Rainer E & Lea; Lakebay WA  
 Town Sheri L; Lakebay WA  
 Trees William J & Jane A; Wauna WA  
 Ude Stephen A & Jonell D; Gig Harbor WA  
 Van Devanter Aaron T & Wanda L; Kirkland WA  
 Van Slyke Tom H; Vaughn WA  
 Vaughn John S & Barbara L; Lakebay WA  
 Vivar Isabelo F & Lea A; Sugar Land TX  
 Von Kanel Adolf & Dolores; Longbranch WA  
 Voss Jerry M & Stacy G; Lakebay WA  
 Waddell Barbara J; Vaughn WA  
 Wagner Rick; Walnut Creek CA  
 Wagner Robert E; Vaughn WA

Wagner Scott E & Suzanne Etal; Gig Harbor WA  
 Wagstaff Stephen M; Lakebay WA  
 Wakefield David A & Barbara L; Longbranch WA  
 Waldron Timothy D & Penny G; Wauna WA  
 Walen Edwin J & Susan E; University Place WA  
 Walker Myrtle; Gig Harbor WA  
 Walsh Donald L; Tacoma WA  
 Wangeman M A; Bellevue WA  
 Ward Anna; Tacoma WA  
 Ware Family Lt; Gig Harbor WA  
 \*Wash St Dept of Fish & Wildlife; Olympia WA  
 Washington State Of; Olympia WA  
 Weathersby William J; Olympia WA  
 Webster, Keith E; Gig Harbor WA  
 Wentworth Gene & C M Robinson; Tacoma WA  
 Werner Madeline A; Gig Harbor WA  
 West Steven B & Shirley I; Gig Harbor WA  
 Westby Matthew & Patti; Lakebay WA  
 Wheeler Nancy L; Lakebay WA  
 Whites Gerald & A K Cummings; Gig Harbor WA  
 Whitman John B, Gdn; Gig Harbor WA  
 Whitman Robert P; Gig Harbor WA  
 Wickline Margaret J; Torrance CA  
 Wiggins David R; Tacoma WA  
 Wikoff Joseph F Jr & Laura G; Wauna WA  
 Wilhelm Albert; Wauna WA  
 Wilkinson Randy & D R Engelhard; Lakebay WA  
 William A Eastman & Co Inc; Bainbridge Island WA  
 Williams Melvyn S & Antoninette M; Lakebay WA  
 Williams T D & J A Smith; Lakebay WA  
 Williams William R; Federal Way WA  
 Wilson Barbara A; Wauna WA  
 Wilson Donald F & Linda A; Livingston TX  
 Wilson Steven J & H J Paul; Tacoma WA  
 Wilson Wesley W & Sara; Lakebay WA  
 Wood James Melvin; Black Diamond WA  
 Wood Stephen E & Lora A ; Gig Harbor WA  
 Woods Lisa; Gig Harbor WA  
 Wright Robert & Vonda T; Gig Harbor WA  
 Wright Willard E; Port Orchard WA  
 Wright William A & Irma L; Lakebay WA  
 Wyciskala Karen A; Tacoma WA  
 Xavier Victoria; Walnut Creek CA  
 Yost Jay A & Barbara; Pasadena CA  
 Zenz Doris F; Gig Harbor WA  
 Zimmer Gregory A; Palo Alto Ca  
 Zueger Thomas E Sr & Toni A; Gig Harbor WA  
 Zuerlein Mark J; Kent WA  
 Zvara John T; Vaughn WA  
 Smith Samuel D & Carol F; Woodland WA  
 Ulsh Wesley C; Gig Harbor WA  
 Ulsh Idalaine R; Seattle WA  
 Anderson Isl Park & Rec; Anderson Island WA  
 Love Matt A & A E Sales; Tumwater WA  
 Beell Thomas L; Ames IA  
 Schaeffer James P; Tacoma WA  
 Shaw Richard H; Fox Island WA  
 \*Travis Nelson, WDFW, Orting WA  
 City of Gig Harbor, Gig Harbor WA  
 \*Mason County, Shelton WA  
 \*Kitsap County, Port Orchard WA  
 Anderson Island Citizens Advisory Board  
 Paul Dugger, Oro Bay Yacht Club, Anderson Island  
 Island General Store; Anderson Island  
 \*Department of Ecology, Lacey WA  
 Peninsula School District, Gig Harbor WA  
 Nisqually Tribe of Indians; Yelm WA  
 Squaxin Tribe of Indians; Shelton WA  
 Sunnycrest Nursery; Key Center WA  
 Home Feed & Grocery; Home WA  
 Key Peninsula News; Vaughn WA  
 Lakebay Marina; Lakebay WA  
 \*Terry Lee, Pierce County Council  
 \*Dick Muri, Pierce County Council  
 \*Pierce Conservation District, Puyallup, WA  
 \*Pierce Stream Team; Puyallup, WA

- \*Pierce County Library System, Tacoma, WA
- \*Steve Marek, Tacoma-Pierce County Health Dept
- \*South Puget Sound Salmon Enhancement Group; Olympia, WA

- \*PW & U, Transportation Planning

