

SUMMARY

In 1999, King County expanded the service area of its surface water utility to much of the rural area of the County. The County is committed to providing a comprehensive surface water program to these new areas. In 2001 the King County Council authorized the accelerated development of reconnaissance reports for Boise Creek, Patterson Creek, and Vashon-Maury Island (VMI). Additional basins are proposed to be studied in the future based on funding availability. The Vashon-Maury Island Rapid Rural Reconnaissance (RRR) Report is one of three reports prepared to assess these rural drainage basins in King County's expanded surface water service area. The reports provide a general overview of the existing stream and basin conditions and problems related to surface water in these rural areas and identify high priority capital improvement needs, property acquisition, studies, and programs such as education/stewardship. The Vashon-Maury Island RRR Report also gives a detail discussion of the habitat needs and general discussion of groundwater and the nearshore habitat. The RRR Reports present plans for existing and future drainage infrastructure and habitat needs in a way that identifies how to reduce road and property flooding, protect and enhance aquatic habitat and groundwater, and reduce stormwater pollution.

SCOPE OF ANALYSIS

The two primary goals of the Vashon- Maury Island RRR Report were to ecologically characterize the drainage basins for Judd and Shinglemill Creeks and to prepare an action plan for protecting the existing natural drainage systems, groundwater, nearshore habitat, and to address existing drainage, water quality, and erosion problems on Vashon-Maury Island. Predevelopment and existing-conditions flows were estimated for the Judd Creek and Shinglemill Creek drainage basins using the Hydrologic Simulation Program-FORTRAN (HSPF) drainage model. Judd Creek and Shinglemill Creek were selected to be modeled because they were the largest drainage basins on VMI and contained areas of higher urban uses than other areas on the island. A habitat assessment was also conducted for these two basins. Drainage, water quality, groundwater, and stream and nearshore habitat needs were developed for the entire island by using the information developed for Judd Creek and Shinglemill Creek and based on interviews with King County Road Maintenance and Department of Natural Resources staff and island residents, other reports, and limited field investigations.

BASIN DESCRIPTION

The Vashon-Maury Island (VMI) basins that were modeled are the Judd Creek and Shinglemill Creek drainage basins, located in King County, Washington. The HSPF model was used to estimate the low and mean daily flows and flow frequencies. This information was used in the habitat analysis and in evaluating infrastructure needs.

The Judd Creek Basin is located in the middle of Vashon Island and covers 3,292 acres (5.1 square miles) or approximately 14% of VMI. Judd Creek empties into Puget Sound through Quartermaster Harbor. Judd Creek is 3.0 miles long and has approximately 30,300 feet of Class 2 stream. The elevation of the Judd Creek Basin varies from sea level in the south to over 440 feet in the north. Soil types in the basin are 69 percent till, 30.6 percent outwash and 0.4 percent wetland. Based on existing (2001) land use conditions, 2.2 percent of the basin is estimated to be impervious.

The Shinglemill Creek Basin is located in the northern portion of Vashon Island and covers 1,846 acres (2.9 square miles) or approximately 8% of VMI. Shinglemill Creek empties into Puget Sound near the northwest corner of the island. Shinglemill Creek is 2.7 miles long and has approximately 19,000 feet of

Class 2 stream. The elevation of the Shinglemill Creek Basin varies from sea level to about 420 feet at its southern height. Soil types in the basin are 98 percent till, 1.5 percent outwash and 0.5 percent wetland. Based on existing (2001) land use conditions, 2.0 percent of the basin is estimated to be impervious.

Washington Trout identified 75 drainage basins on Vashon-Maury Island, including the Judd and Shinglemill Creeks basins. The 73 other basins range from 14 to 1,117 acres. Analysis of these basins did not include modeling and relied heavily on interviews with King County Road and Department of Natural Resources staff and island residents, other reports, and limited field investigations. These sources were also used to determine existing infrastructure and habitat needs.

Drainage systems on Vashon-Maury Island consist mainly of open channels and road culverts. There are several large wetlands that are recharge areas and are at the headwaters of many of the drainage basins on the island.

ASSESSMENT OF SUBBASINS

To characterize the drainage basins for Judd and Shinglemill Creek, they were first subdivided into a total of seven subbasins, three for Judd Creek and four for Shinglemill Creek. For each subbasin, a systematic inventory and analysis of stream conditions and drainage systems was conducted, covering resources and problems under current and future land uses. Each subbasin was ranked using the methods of the Center for Watershed Protection's *Watershed Vulnerability Analysis*. The eight-step analysis provides the following information for each subbasin:

- An initial subbasin classification, based solely on impervious area
- A final subbasin classification, based on more detailed assessments of conditions along the stream corridor and throughout the subbasin
- A ranking of subbasin vulnerability to impacts from future changes
- A priority ranking for which subbasins most merit prompt restoration activities.

The Watershed Vulnerability analysis is described in Appendix G and the results are described in Chapter 10 and Appendix G.

GROUNDWATER

The groundwater system beneath Vashon-Maury Island is designated a "sole source aquifer" by the Environmental Protection Agency, because precipitation falling on the island is the only source for groundwater within the aquifer and the aquifer is the primary drinking water source for island residents. As such, it is important to protect the aquifer from contamination. Potential contamination sources include: failing on-site septic systems, seawater intrusion, stormwater runoff, leaking underground storage tanks, landfills, industrial properties, land application of pesticides and fertilizers, and wastes derived from animals and livestock. Areas highly susceptible to contamination from potential pollution sources warrant special protection. Recommended actions include preservation and protection of these areas, education/stewardship, and increased monitoring of groundwater quantity and quality on the island.

NEARSHORE HABITAT

The Vashon-Maury Island nearshore is a unique and important natural resource. Based on state GIS data, the nearshore accounts for 51 miles of shoreline, which represents more than half of the 96 miles of shoreline in Water Resource Inventory Area 9 (WRIA 9) in King County (when including Vashon and Maury Islands). Eroding steep coastal bluffs, along with contributions from coastal streams, provide

material for nearshore sediments and beaches. Nearshore habitats around the island include eelgrass meadows, kelp forests, tide flats, tidal marshes, sub-estuaries, sand spits, beaches, backshore, banks and bluffs. These habitats support a variety of communities and ecosystem functions. Substantial modifications have occurred to the island's nearshore: Much of the shoreline is armored, and shoreline vegetation removed. The waters of Quartermaster Harbor, an important spawning area for forage fish such as sand lance and surf smelt, are listed for impaired water quality and need protective measures against further impairment and restorative actions to improve water quality.

The Central Puget Sound Basin as a whole is the most heavily urbanized area in the Puget Sound region, and the impacts of human activities have taken a toll on natural resources and the habitat that supports them. Nearshore habitat alterations, degradation, and losses have resulted from a number of activities, including filling, dredging, shoreline armoring, over-water structures, waste and wastewater disposal, nonpoint-source pollution, vegetation removal, shoreline development, roads, and changes in hydrology. Significant landscape changes and species extinction or reduction has occurred in less than 130 years. As a result, many salmonid stocks are in serious decline. In the Puget Sound region, chinook salmon and bull trout are listed as threatened under the Endangered Species Act. Coho salmon is a candidate species for listing. Although the problems contributing to habitat and species decline are complex and extend beyond the Vashon-Maury Island nearshore, the island's nearshore and its tributary areas are important and interrelated components of this system.

Recommended actions for the Vashon-Maury Island nearshore habitat include preservation of the undeveloped shorelines and restoration of the habitat in degraded areas.

RECOMMENDED ACTIONS

Based on the subbasin analysis and two King County workshops, 39 Action Items were identified to help restore natural flows and sediment regimes, restore fish passage and habitat by reconnecting fragmented environments, and reduce risks to health, safety and aquatic habitat. These Actions consisted of CIP projects, right-of-way acquisition, studies, and programs. They were then ranked by County staff as high, medium, and low. Ranking criteria used consisted of the following: 1) Ecological Significance, 2) Threat to Life, Limb, and Property, and 3) Project Efficacy (what is the likely-hood of project success). The details of this ranking criterion is shown in Figure 11-2.

Some Actions did not have enough information to rank them and were added to another list. The ranked projects are shown in Table S-1 and the unranked projects are shown in Table S-2. Ranking sheets were prepared for each of the projects and are shown in Chapter 11.

Project VMI#	Rank	Project Name	Project Type	Estimated Cost
8	H	Grand Canyon on Shinglemill Creek	CIP	>\$250K
12	H	Replace culvert at mouth of Ellisport Creek and remediate soils at Ellisport Creek	CIP	\$1,167,000
14	H	Fish Barrier Removal	CIP	\$276K/Yr
19	H	Natural Drainage Standards & Demo Project	Regulation	>\$250K
37	H	East Fork Judd Erosion & Habitat degradation	CIP	>\$75K
38	H	West Fork Judd Habitat Improvements	CIP	>\$50K
32	H	Lower Shinglemill Habitat Improvements	CIP	>\$250K

16	H	Groundwater Monitoring	Program	\$1.5M/7Yrs
25	H	Riparian Habitat Restoration	Program	<\$75
20	H	Bulkhead Assessment and Nearshore Habitat Restoration	Study	<\$75
26	H	Islandwide Natural Resource Land Inventory	Study	<\$75
7	H	Judd Creek Headwater Wetland Property Acquisition	Acquisition	\$1.5M
10	H	Piner Point Acquisition	Acquisition	\$250K-\$450K
2A	M	Gorsuch Creek Debris Rack Installation	CIP	\$50K
3	M	Water District 19 Diversion Structure Modification at Beal Creek, Ph 1	CIP	\$60K
4	M	Wetland 4301 Protection and Enhancement, Phase 1	Study	\$26K
5	M	Tahlequah Creek Habitat Improvements	CIP	\$272K
9	M	Portage Salt Marsh Habitat Restoration	CIP	\$1.03M
18	M	Fish Screens at Water Diversions	CIP	\$34K/Yr
30	M	KVI Beach Conservation	Program	<\$75
33	M	Septic System Improvement	Program	\$75-\$250K
15	M	Landslide / Drainage Study	Study	\$59K
17	M	Establish Minimum In-Stream Flows	Study	\$45K/Yr
29	M	Baseline Habitat Survey	Study	\$75-\$250K
11	M	Glacier Nearshore Conservation	Acquisition	\$4-\$8M
6	L	Mileta Creek Culvert Replacement	CIP	>\$250K

TABLE S-2 Unranked Actions		
Project VMI#	Project Name	Project Type
1	Raab's Creek and Estuary Restoration	Study
2B	Gorsuch Creek Abandoned Road Removal	CIP
13A	Upland pond & wetlands	Acquisition
13B	Aquifer Recharge Protection	Study
21	SW Band and 107th Flooding Reduction	CIP
22	Vashon Highway at Shawnee Hill Culvert Replacement	CIP
23	Water Quality Study	Study
27	Docton cross tiles	CIP
28	Canyon at Christensen Creek	Study
31	Kellogg Flooding	CIP
35	SW Bank and 103rd Flooding Reduction	CIP
36	Gorsuch Creek channel degradation and erosion	CIP
39	Education Program "Stewarding Your Land"	Program
NOTE: Priority ranking will be developed after gathering more data.		

FURTHER ACTIONS NEEDED

Public Education

King County has an ongoing public education program. However, more work is needed to educate the residents on Vashon-Maury Island about how the creeks, wetlands, and nearshore are impaired, what they can do to help protect groundwater quality and quantity and improve the nearshore and stream habitats, and what the County and others are doing.

Coordination with Other Agencies

The needed improvements and protections cannot be done by one agency, jurisdiction, or citizen groups. King County should continue to encourage and facilitate multi-jurisdictional efforts and continue to bring issues to light. It is recommended that a meeting be held with all involved agencies, jurisdictions, and citizen groups to develop a comprehensive plan to start implementing the recommended actions. Some of the key agencies and groups are King County, the Washington Department of Fish and Wildlife, the Washington Department of Ecology, Washington Department of Natural Resources, the Vashon-Maury Island Ground Water Advisory Committee, Vashon-Maury Island Land Trust, Land Use and Natural Resources Committee of the Vashon-Maury Island Community Council, and water purveyors.

Updates to Reconnaissance Report

This report was an analysis of existing data. More fieldwork to identify specific habitat needs island-wide is needed (except for Judd Creek and Shinglemill Creek) to improve the island-wide habitat assessment. Also, the hydrology model can be improved for Judd Creek and Shinglemill Creek by calibrating the model to local precipitation data and surveying channel characteristics (cross-sections, slope, existing drainage structures) for each of the basins.