

# Executive Summary

The White River Basin Characterization Report describes drainage, flooding, water quality, and aquatic habitat conditions and problems in the White River planning area. The report was prepared by Pierce County Public Works and Utilities Water Programs Division (Water Programs), which is responsible for surface water management in unincorporated Pierce County.

Water Programs prepares basin plans to identify and prioritize capital improvement projects and other Water Programs activities in individual drainage basins. Basin plans address the flooding, water quality and aquatic habitat aspects of surface water management in the major stream systems of the non-federal lands within unincorporated Pierce County. Water Programs uses the basin plans to develop its capital improvement, maintenance, repair, property acquisition, and program schedules and budgets.

Water Programs' basin planning process has three phases. **Phase 1** involves basin characterization, with a primary focus on identifying key problem areas and data gaps that will need to be addressed in Phase 2. **Phase 2** is the plan development and adoption phase. It builds on the findings of Phase 1 by filling information gaps, correcting information, performing hydrologic analyses based on planned future conditions, investigating problems, identifying alternatives, and recommending solutions. **Phase 3** involves plan implementation, monitoring, and updating. This Basin Characterization Report documents the results of Phase 1 in the White River basin planning process.

The White River basin planning area is comprised of the Upper White River, Lower White River, and Mud Mountain basins. These basins, which are collectively referred to as the White River Basin, encompass approximately 496 square miles. Approximately 75% of the White River Basin is within Pierce County; the remainder is in King County.

The White River Basin Plan focuses on the unincorporated, non-federal portions of the watershed that are under Pierce County's jurisdiction. Much of the upper basin lies within National Forest lands or Mount Rainier National Park. Therefore, this Characterization Report focuses primarily on the Lower White River and Mud Mountain portions of the basin.

The White Basin Characterization Report describes the key stakeholders and regulatory issues related to surface water management in the basin as well as the physical characteristics of the basin. The report describes the hydrology, water quality, topography, geology, and soils; existing and planned land uses; aquatic habitat conditions; and existing surface water management facilities in the basin. In addition, the report documents the drainage, flooding, water quality, and habitat problems in the planning area. These conditions and problems were identified based on a wide variety of data sources, including:

- Pierce County GIS data (e.g., topography, hydrography, land use)
- Pierce County Service Response Summary database
- Aquatic habitat and water quality data collected by Pierce County and its consultants
- Questionnaires completed by landowners in the planning area
- Input provided at public meetings
- Reports published by Pierce County, the Nisqually Tribe, USGS, Ecology, FEMA, FERC, and other sources
- Field investigations to assess potential problem areas

The following sections summarize the drainage, flooding, water quality, and aquatic habitat conditions identified in the Characterization Report.

## Drainage and Flooding Conditions

- Pierce County Water Programs' River Improvement Division maintains nearly 30,000 linear feet of flood control levees along the White River. According to Water Programs' 2005 Capital Improvement Program (CIP), six percent of the White River levee system is currently rated "adequate" (i.e., provides protection for a 100-year recurrence interval flood).
- The Mud Mountain Dam is the primary flood control structure on the White River. An informal agreement between the U.S. Army Corps of Engineers (USACE), the Muckleshoot Tribe, and Pierce and King Counties limits the rate of water release from the dam to 12,000 cfs, when feasible.
- This basin characterization study did not identify any significant flooding problems associated with the County's storm drainage system or on tributaries to the lower White River.
- The impervious surface estimates for current land use in the planning area range from 0 to 14 percent. The Upper White River, Lake Tapps, and Lower White River sub-basins have the highest impervious surface percentages with 8, 10, and 14 percent, respectively. The remaining sub-basins range from 0 to 4 percent impervious. Based on the current zoning, impervious surface areas in the planning

area may range from 0 to 20 percent at full build-out. The greatest increases in impervious surface area are expected to occur in the Lower White River sub-basin.

- Lake Tapps is the only significant lake in the White River Basin. Lake Tapps was built more than 90 years ago to provide water storage for a hydroelectric facility. The lake was created by building approximately 2.5 miles of earthen dikes and embankments around four small natural lakes. A dam on the White River near Buckley diverts water to the lake via a canal. The lake discharges water back into the White River via a tailrace that enters the river near Sumner. Puget Sound Energy (PSE) owns the lake and its associated facilities. PSE has ceased hydropower generation at Lake Tapps and is currently in negotiations to sell the lake (and the associated water rights). In the future, the lake may be used for recreation and municipal water supply rather than hydropower.

## Water Quality Conditions

- The current overall water quality in the White River is generally good, except for pH and temperature. Water quality in the tributaries is variable and marginal for parameters such as temperature, turbidity, and dissolved oxygen in the more developed areas of the basin.
- Water quality monitoring conducted during 2004-2005 found that water quality in Lake Tapps was generally good. Nitrogen to phosphorus ratios indicate that phosphorus is the key nutrient limiting algal growth in the lake. The total phosphorus (TP) and chlorophyll-a values were relatively low, indicating that the lake was not eutrophic. Lake water quality was generally good even though flows through the lake were low compared to historic flows.
- During the 2004-2005 monitoring, the White River appeared to be the main source of phosphorus entering Lake Tapps. TP and fecal coliform concentrations in the embayments were relatively low despite the numerous septic systems and stormwater outfalls along their shorelines. This suggests that septic systems and stormwater discharges are not major sources of TP or bacteria at present. However, septic systems and stormwater discharges could affect lake water quality in the future.
- There are more than two thousand septic systems around Lake Tapps. Septic system effluent typically contains high concentrations of phosphorus and bacteria. Septic system drainfields tend to clog over time. Severe clogging can result in surface failures and allow inadequately treated effluent to flow overland into the

lake, with little contaminant removal en route. In general, the risk of failures is generally greater for older systems.

- Septic systems can also contribute phosphorus to the lake via groundwater. Phosphorus usually moves very slowly in soil and groundwater because it adsorbs on soil particles and forms chemical complexes with low solubilities. It is possible that phosphorus plumes from shoreline drainfields exist but have not reached the lake yet. If these septic systems remain in use, phosphorus plumes could eventually reach the lake via groundwater.
- Water quality in Lake Tapps may be affected by operations of the diversion dam and lake outlet. The “operating rules” for Lake Tapps are the subject of on-going negotiations involving multiple parties. Pierce County Water Programs does not own the lake and does not have authority over its operation. However, Water Programs can perform water quality management activities, such as non-point pollution source control, water quality monitoring, and implementation of stormwater quality Best Management Practices. Water Programs’ activities will need to be tailored to the lake operating rules that result from the negotiations cited above.

## Aquatic Habitat Conditions

- Aquatic habitat and fish passage conditions and Pierce County jurisdiction to address these conditions vary according to the location in the White River Basin. Many of the streams in the lower White River Basin are within the incorporated cities of Sumner and Auburn as well as King County, and most of the streams in the upper White River Basin are within federal lands or commercial forest lands. There are opportunities for Pierce County to work in partnership with these other jurisdictions to address water resources issues in the basin.
- Many of the tributaries to the White River west of Lake Tapps have been adversely impacted by urban development and most were rated in poor or fair condition for aquatic habitat. These tributaries are primarily located in incorporated areas of Pierce County.
- The primary fisheries issues on the White River mainstem are related to low stream flows in the bypass reach (reach between the Buckley diversion canal and the Dieringer Canal). Elevated stream temperatures in the bypass reach may be a result of low flows and have the potential to limit rearing capacity for bull trout and juvenile anadromous salmonids. Low flows resulting from the Buckley diversion and Mud Mountain Dam also have the potential to create both temperature and physical barriers to fish passage.

- Other fisheries issues on the mainstem related to the two dams on the White River include the loss of pool habitat, recruitment of spawning gravels, and the lack of LWD recruitment. Urbanization in the lower White River basin has also reduced the potential for recruitment of LWD into the mainstem.
- Artificial passage problems exist at the culvert under the Burlington Northern railroad tracks (Tributary 0038) and at the concrete control structure diverting water to constructed wetlands (Tributary 0040). The latter barrier could be considered a Pierce County responsibility.