



Focus: Gibbons Creek

Effectiveness and Trend Monitoring by Volunteers

This report summarizes the first of a three-part project to monitor water quality in the Gibbons Creek watershed in Clark County, Washington. In early 2004, the Washington State Department of Ecology (Ecology) initiated a collaborative effort with the City of Washougal and Clark County to develop a monitoring strategy to assess fecal coliform levels and turbidity in the watershed. Part 1 of the study was carried out by staff of Clark County Public Works, staff of City of Washougal Wastewater Treatment Plant, and trained volunteer monitors. It resulted in a 2-year data set for fecal coliform bacteria and turbidity levels, as well as an evaluation of recent cleanup activities in the watershed.

Background

Ecology initially sampled Gibbons Creek at the Evergreen Highway crossing during the 1992 Statewide Ambient Monitoring Project. Water quality standard violations for fecal coliform bacteria placed Gibbons Creek on the state's 303d list for impaired waterways. Ecology conducted a Total Maximum Daily Load (TMDL) assessment in 1995



in order to establish fecal coliform limits and to identify potential cleanup activities.

In 2000, Ecology began the process of developing the water cleanup plan for Gibbons Creek, and completed the *Gibbons Creek Watershed Fecal Coliform Total Maximum Daily Load Submittal Report*. The submittal report contains the summary implementation strategy, which is the general plan for identifying pollution sources, pollution control measures, responsible government programs, funding sources, and strategies to eliminate the pollution. The report was submitted to and approved by the U.S. Environmental Protection Agency in August 2000.

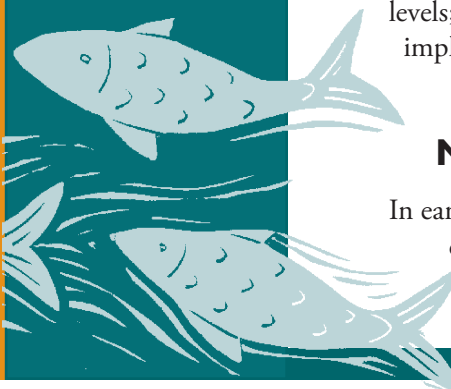
Ecology then developed a detailed implementation plan (DIP) scheduling specific implementation activities to achieve fecal coliform bacterial reductions specified in the TMDL submittal report. The plan provides a framework for identifying pollution sources; implementing best management practices (BMPs) and control measures; monitoring pollution levels; establishing performance measures, assigning responsibilities, and timelines for implementation; identifying and aligning prospective financial and community resources for implementation; and tracking compliance with TMDL targets.

Monitoring

In early 2004, Ecology collaborated with the City of Washougal and Clark County to develop a strategy to conduct the monitoring required by the DIP. The monitoring would assess fecal coliform levels in the Gibbons Creek watershed using the following objectives:

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- Initiate preliminary source identification of fecal coliform and turbidity
- Track relative fecal coliform and turbidity levels in various tributaries in the watershed
- Involve the local community in water cleanup planning and monitoring
- Determine effectiveness of previous TMDL implementation activities on water quality

The project was implemented by staff of Clark County Public Works, staff of City of Washougal Wastewater Treatment Plant, and trained volunteer monitors. Clark County provided guidance, equipment, and volunteer coordination through the Volunteer Monitoring Program and Resource Center. The City of Washougal provided analytical services at the treatment plant laboratory, which is accredited by Ecology and routinely analyzes samples in accordance with their wastewater discharge permit.

A dedicated team of volunteers from the community monitored the creek's water quality for two years, completing 24 sampling events in a variety of weather conditions and seasons. The monitoring surveys utilized seven monitoring stations that were visited at approximately monthly intervals (see map below).

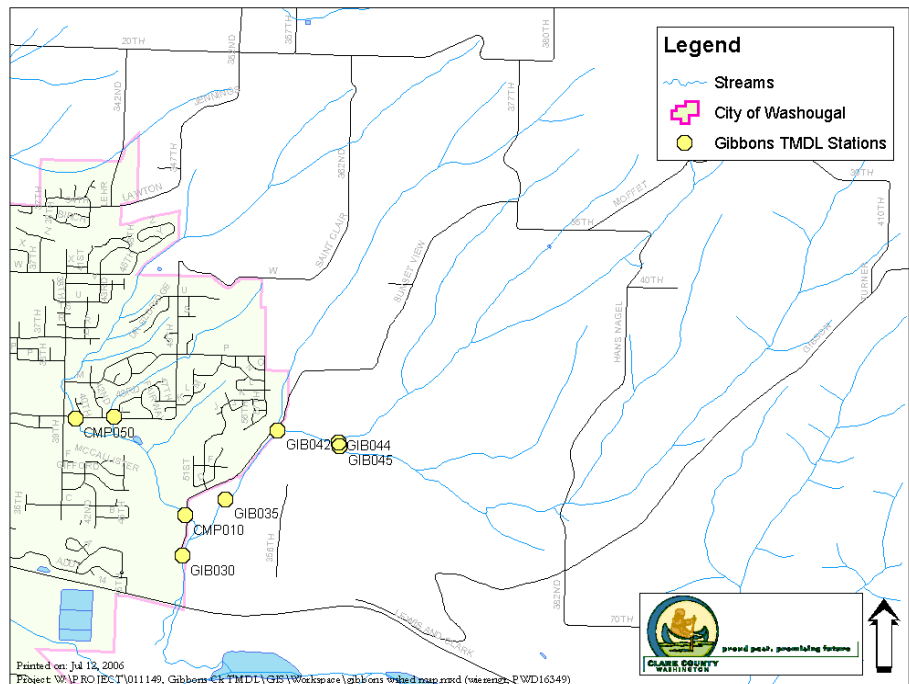
Results

The results show that many of the waterways in the Gibbons Creek watershed continue to have fecal coliform bacteria and turbidity levels that exceed water quality standards. Geographically speaking, the upper mainstem and tributaries of Gibbons Creek are in good condition relative to the other tributaries in the watershed. Although sources of bacteria exist in the upper drainages, expending resources to locate and remove them is not critical at this time.

The focus of future monitoring and pollution source removal programs should likely be Campen Creek and the

Gibbons Creek tributary that follows Sunset View Road. Stations in both the lower and upper reaches of Campen Creek consistently had higher levels of bacteria than upper Gibbons Creek.

The results also indicate that fecal coliform bacteria pollution enters the creeks from multiple sources. For instance, bacteria and turbidity levels were often higher during rain events, particularly in late summer and early fall. This result indicates that storm water runoff is a significant conduit for conveying pollutants in pulses. On the other hand, routinely high bacteria levels during dry summer weather points to continuous, non-storm water runoff sources of bacteria, such as illegal discharges and failing septic systems. A likely conclusion is that July through October is the most critical period for controlling both large pulses and persistent continuous sources of fecal coliform and turbidity to the creeks.



Recommendations

This collaborative monitoring effort addressed an important data gap. The results of this project will help Ecology and local jurisdictions direct limited resources for improving conditions in Gibbons Creek.



The following recommendations are possible next steps for locating and removing sources of fecal coliform bacteria and turbidity in the watershed:

1. Perform a watershed analysis to describe the natural and developed characteristics of the drainage that create vulnerable conditions for surface water pollution, and to identify potential sources of pollution, such as parking lots, septic systems, and farming operations.
2. Assess both privately and publicly owned storm water infrastructure (conveyance, storage, and treatment features) with desktop and field assessment tools.
3. Monitor fecal coliform and turbidity levels during both dry and wet weather from July to October, particularly during or after intense storms in the early fall. Monitoring stations should be densely located along reaches where higher levels of bacteria have been observed, such as the Gibbons Creek tributary along Sunset View Road and throughout Campen Creek.
4. Initiate source assessment activities, such as storm sewer outfall screening, septic system surveys, and stream assessments.
5. Coordinate with Clark County Public Health for septic system inspection, survey, and education in drainages showing high levels of fecal coliform (a TMDL implementation activity).
6. Continue quarterly monitoring at the volunteer site located on Gibbons Creek near the Jemtegaard Middle School.
7. Establish a long-term stream flow monitoring gauge on Gibbons Creek for water quality monitoring and fisheries management activities.

8. Coordinate with the Clark County Conservation District to identify potential riparian improvement/restoration sites for decreasing water temperatures and filtering out pollutants in storm water runoff from agricultural and open areas. Potential locations in lower Gibbons and Campen Creeks include the reach running along Jemtegaard Middle School and upstream along Sunset View Road, and along the Orchard Hills Golf Course. Locations in upper Gibbons Creek, above Hans Nagel Road, may also be ideal for riparian habitat improvement projects.

Acknowledgements

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For more information about the water quality of the lake:

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Or, visit the **Clean Water Program** website:
www.clark.wa.gov/water-resources



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