The 754 acre Stephens Subwatershed in southwest Portland contains one of the last remaining surface streams in the city that flows freely to the Willamette River. The Burlingame trunk sewer follows the course of Stephens Creek as it flows through a forested canyon from SW Terwilliger Boulevard and Interstate 5 east past Fulton Park to SW Taylors Ferry Road.

Over time, high stream flows eroded the banks and stream bed and exposed sections of the 36-inch, concrete sewer pipe that the city installed in the 1950s. Erosion also degraded fish and wildlife habitat.

Environmental Services implemented a project to repair the sewer line and improve stream conditions in two phases. The first phase, completed in 2006, repaired and protected the sewer pipe to improve reliability and control leaks, and started reconstruction of portions of the streambed and banks. The second phase, completed in 2008, completed streambank and channel reconstruction. Both phases included removing non-native, invasive plants and restoring native vegetation.

Environmental Services will continue monitoring to determine if the project meets its goals, to gauge over time whether it achieves desired future conditions, and to identify lessons learned that can improve future enhancement projects. Data gathered also helps measure city progress in improving watershed health and complying with state and federal regulations.

### Future Monitoring

Water quality monitoring still periodically detects *E. coli* bacteria in Stephens Creek. The highest concentrations are in the upper portions of the subwatershed above the sewer line repairs. The likely sources are sewer system leaks, septic systems, and wildlife and pet waste.

In addition to monitoring specific projects, the city is implementing a Portland Area Watershed Monitoring and Assessment Program (PAWMAP) to track water quality, habitat conditions and the health of biological communities in all Portland watersheds to better evaluate long-term health trends. A PAWMAP monitoring station in the Burlingame project area has detected high copper levels, which are typically associated with transportation corridors. Engineers used the data in designing a facility to be constructed in the Stephens Creek central canyon area to adequately treat stormwater runoff from Interstate 5.

A city pilot study in the Stephens Creek subwatershed is contributing to the development of a subwatershed stormwater system plan that Environmental Services will use as a model to address the negative effects of uncontrolled stormwater runoff on watershed health citywide. As the city continues to implement individual projects throughout the subwatershed, the health of Stephens Creek, and the whole Willamette Watershed, will continue to improve one step at a time.

### For More Information

Marc Peters, 503-823-9389 [www.portlandoregon.gov/bes](http://www.portlandoregon.gov/bes)
The City of Portland finished work on the Burlingame Sewer Repair and Streambank Enhancement Project in 2008. The project’s goals were:

- To repair and protect the Burlingame Trunk Sewer along Stephens Creek;
- To control sewage leaks that increase Escherichia coli (E. coli) bacteria in Stephens Creek;
- To restore and stabilize the eroded banks and stream bed of Stephens Creek; and
- To remove invasive, non-native vegetation near the stream channel and restore native vegetation.

Project Results

Environmental Services monitoring since the project’s completion has identified the following:

- The E. coli bacteria level in Stephens Creek has gone down. Water quality testing before the project showed that the creek exceeded E. coli standards 71% of the time compared to 38% of the time after the project’s completion. Environmental Services will continue to sample for E. coli in an effort to determine sources of bacteria that persist within the subwatershed.

- Stream surveys show that rock weirs, streambank armoring, overflow channels and soil wrapped walls have stabilized the stream channel and banks. These improvements also dissipate energy from high stream flows to more effectively control erosion, protect city sewer infrastructure, enhance in-stream water quality, and improve habitat for aquatic life.

- Removal of non-native, invasive vegetation (English ivy, holly, laurel, Himalayan blackberry) has allowed the re-establishment of native species (Oregon ash, Western red-cedar, black cottonwood, Pacific ninebark, Indian-plum, red-osier dogwood, snowberry).

In 2005, the lower reach wetland was disconnected from the creek.

In 2011, the wetland shows a healthy mix of native plants enhancing the watershed.

In 2005, the lower reach wetland was disconnected from the creek.

After construction Stephens Creek has better connectivity to the riparian wetland.

In 2011, the wetland shows a healthy mix of native plants enhancing the watershed.
Burlingame Sewer Repair and Streambank Enhancement Project Update

The 754 acre Stephens Subwatershed in southwest Portland contains one of the last remaining surface streams in the city that flows freely to the Willamette River. The Burlingame trunk sewer follows the course of Stephens Creek as it flows through a forested canyon from SW Terwilliger Boulevard and Interstate 5 east past Fulton Park to SW Taylors Ferry Road. Over time, high stream flows eroded the banks and stream bed and exposed sections of the 36-inch, concrete sewer pipe that the city installed in the 1950s. Erosion also degraded fish and wildlife habitat.

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