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It takes a forest to save a fish: Monitoring changes in forest cover to help save salmon in King County

by Scott Stolnack

WHY DO YOU NEED TREES TO SAVE SALMON?

Forests filter rainwater, help keep streams cool and clear, and help provide complex habitat for salmon to spawn, rear and grow. Without forests, salmon probably wouldn't survive in King County. This is one reason that the County's salmon recovery plans and other guidelines include recommendations to protect forests wherever possible. And where it's not realistic to conserve whole forests, local "critical areas" rules still protect trees and shrubs along our most sensitive streamside areas.

With this in mind, Water Resource Inventory Area 8 (WRIA 8)¹, the Lake Washington/ Cedar/ Sammamish Watershed (see **Map 1**), received a grant from the Puget Sound Partnership to see if forest cover was being appropriately maintained in the watershed as recommended in its salmon recovery plan. Using satellite images, aerial photographs, and Geographic Information Systems (GIS) computer technology, we measured land cover change at two scales: over the whole watershed in general (inside and outside the Urban Growth Area boundaries), and at a much finer scale along a small sample of important stream reaches.

To make the work more manageable we divided the watershed into 47 separate mini-watersheds or "subbasins,"

and looked at overall forest cover in 1991, 1996, 2001 and 2006. During that 15-year period, overall forest cover inside urbanized areas declined more than 20 percent (**Figure 1**). This decline is not surprising, considering the changes that have taken place in King County since 1991. Areas in rural King County showed no overall loss of forest cover between 1991 and 2006.



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Figure 1. Forest cover change in WRIA 8, 1991-2006. Total area represented in B) does not include the Cedar River Municipal Watershed.

¹ A Water Resource Inventory Area (WRIA), is a geographic watershed area defined by the Washington Department of Ecology for watershed planning purposes. The WRIA boundaries are also used to delineate watersheds for salmon recovery planning. The WRIA 8 watershed is mostly within King County, though about 15 percent of the watershed lies in Snohomish County.

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When we focused on streamside areas, where rules about retaining trees are the most protective, we found that forest cover still declined in some subbasins despite these rules. In our finer scale analysis of important stream reaches, we found a surprising 3.8 percent decline in forest cover in those streamside areas.

When we dug a little further, much of the forest cover loss in the streamside areas appeared to be the result of “vested” development in just a few areas, that is, construction legally permitted under older, less-protective rules (**Figure 2**). However, not all of the forest cover loss could be linked to vested development. Some may have been from local property owners cutting down trees or building closer to streams than regulations allowed.

Conclusions

Although the continued loss of forest cover inside urban areas was predictable because development is directed into those areas, we were surprised to find that forest cover declined in some sensitive urban streamside areas. Much of this unanticipated forest cover loss appeared to have occurred legally, because they were permitted under prior sensitive areas rules.

Jurisdictions in WRIA 8 are planning to use this information to improve protection of streamside areas in two ways: (1) connect with private landowners to help them be good stewards of the streams in their backyards, and (2) identify important riparian areas subject to vested development rights, and work with those property owners to find acceptable means of protecting and improving forest cover in those areas.



Figure 2. Example of forest cover change between 2006 (left) and 2009 (right). This development was legally permitted under prior sensitive areas rules.

Report Citations and Sources

Vanderhoof, J., S. Stolnack, K. Rauscher, and K. Higgins. *Lake Washington/ Cedar/ Sammamish Watershed (WRIA 8) Land Cover Change Analysis*. Prepared for WRIA8 Technical Committee by King County Water and Land Resources Division, Department of Natural Resources and Parks. Seattle, Washington, 2011.

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For the full report, go to www.govlink.org/watersheds/8/reports/W8LandcoverChangeReport7-19-2011.pdf

For more on salmon recovery in King County, go to www.govlink.org/watersheds/default.aspx