

Study links forest health to salmon populations

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(PhysOrg.com) -- A new research paper written by Simon Fraser University biologists and published in the journal *Science* concludes that the abundance of salmon in spawning streams determines the diversity and productivity of plants in surrounding forests.

Morgan Hocking and John Reynolds have documented their findings in 'Impacts of salmon on riparian plant diversity.'

It's an extensive study of the interrelationship between salmon and forest ecosystems bordering 50 streams on the remote central coast of British Columbia, Canada.

Reynolds, the Tom Buell B.C. Leadership Chair in Salmon Conservation, says their research resolves a question that previous studies have been unable to address: Do fluctuations in salmon populations, including those driven by human impacts, affect the biodiversity of terrestrial ecosystems?

“We now know that differences among streams in salmon populations translate into differences in the species of plants in adjacent forests. This can ultimately affect animals, insects and birds feeding on those plants,” says Reynolds.

“The impacts of salmon on plants are so radical that, even without knowing how many salmon spawn in specific streams, we can get a good idea by studying the surrounding plant life.”

After factoring in other variables such as stream size and slope, the scientists discovered that where salmon populations were high, overall [plant diversity](#) decreased. But the few species that dominated streamside forest communities, such as salmonberry, elderberry and stink current, were nitrogen-rich plants. They outcompeted other plant species for salmon nutrients.

In the study, [plants](#) with lower nutrient content, such as huckleberry, salal and blueberry, bordered streams with low salmon populations.

“We can now tie the strength of salmon populations to significant shifts in plant species and diversity,” notes Reynolds.

“Changes in the abundance of salmon in the ocean evidently can have far-reaching impacts on the structure and functioning of terrestrial food webs adjacent to streams,” adds Hocking. “We can also now predict that small streams with few alternative sources of nutrients will be most vulnerable to impacts of [salmon](#) declines.”

Provided by Simon Fraser University

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