

Salmon's Trouble With Seattle

Salmon Decline Tied to Pesticides that Disrupt Endocrine System

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It's a rough life being a salmon these days. Just ask the salmon living in America's northwest waters. Not only is their life cycle interrupted by dams and fishing practices, but now salmon must contend with pesticides. It is hard to imagine that the mighty Salmon could be affected by humans' indiscriminate use of toxins, but sure enough, recent research, including a study by the Northwest Coalition for Alternatives to Pesticides (NCAP), shows exactly that. And, the federal government in February declared nine species of Salmon as threatened or endangered, including several species of Puget Sound area's famous Chinook!

In reality, this news should come as no surprise. From 1975 to 1984, foresters in the northwest region of the U.S. used to spray the insecticide Matacil 1.8D to control the spruce budworm in the Northwest watersheds. 4-Nonylphenol (4-NP), used as an inert ingredient in the pesticide formulation, is an estrogen mimic. It is therefore the prime suspect in what's preventing salmon from making crucial

hormonal transformations necessary to adapt from fresh water to salt water when migrating to the sea. The fish simply become unable to expel excess salt from their bodies.

This hypothesis is suggested in a Canadian study entitled, "Effects of water-borne 4-nonylphenol on Atlantic Salmon (*Salmo salar*) smolts," by Wayne Fairchild, et al, in which scientists analyzed spray maps of the area. Though two other forms of Metacil besides Metacil 1.8D were used in the area's forests over the period of time analyzed, no salmon declines were noted—but neither of these two formulations contained 4-NP. Salmon exposed in a laboratory to the Metacil 1.8D, however, exhibited a significant failure to thrive, or died within 2 months of entering salt water. Heavy Metacil 1.8D applications during spring months coincided with the final stages of smolt development.

The May 8, 1999 *Science News* reported on this study, in a story entitled, "Pollutant Waits to Smite Salmon at Sea," pointing out that nonylphenols, which are also found in house-cleaning products and industrial effluent, are not removed efficiently by water treatment plants like other contaminants so they tend to build up in downstream waters. This new research shows us that more attention needs to be paid to inert ingredients contained in pesticide formulations, especially those used in watersheds that feed rivers where salmon

live. (See *Science News*, Vol. 155, May 8, 1999, www.sciencenews.org, and also "Does an Association Between Pesticide Use and Subsequent Declines in Catch of Atlantic Salmon (*Salmo salar*) Represent a Case of Endocrine Disruption?" by Wayne Fairchild, et al., *Environmental Health Perspectives*, Volume 107, Number 5 in May 1999.)

Diminishing Returns: Salmon Decline and Pesticides

In February, 1999, NCAP released a report linking damage to salmon populations with pesticide exposure. In the report, entitled *Diminishing Returns: Salmon Decline and Pesticides*, NCAP notes that while salmon populations have been interrupted by numerous factors, more research on the effects of pesticides is clearly warranted. Salmon can sense when they encounter a polluted area of water and they avoid those areas, thus diverting normal routes of migration and delaying spawning. Pesticides can impair swimming



ability, and may affect salmon indirectly by damaging their habitat and food sources. Toxic runoff has already led to several fish-kills in the Northwest, and the report reiterates that pesticides may impede salmon's ability to adjust from freshwater to saltwater. Exposure to endocrine disrupting chemicals may also interfere with salmon's reproductive systems, as we have seen with other species of wildlife, such as alligators in Florida. All of these factors add up to declining returns of adult salmon to spawn in Northwest streams. *Northwest Coalition for Alternatives to Pesticides*, P.O. Box 1393, Eugene, OR 97440, 541-344-5044, and see "Diminishing Returns" report at <http://www.pond.net/~fish1lfr/salpest.pdf>.

NCAP's study is supported by a timely U.S. Geological Survey study entitled, "The Quality of Our Nation's Waters: Nutrients and Pesticides," that shows trace levels of pesticides in waters around the U.S. The survey analyzed 20 American watersheds including the northwest Willamette watershed. The following finding will surprise most people: pesticide contamination of streams is as high in urban areas as it is in agricultural areas, just with differing types of chemicals. While most stream samples around the country found contamination levels of individual pesticides in compliance with current Environmental Protection Agency drinking water standards, more than half the U.S. streams tested showed concen-

trations of at least one pesticide that exceeded a guideline for protection of aquatic life. Some of the most frequently detected pesticides, though often in trace amounts, are endocrine disruptors. Even compliance levels are questionable given inadequate safety testing regarding additive or cumulative effects and impacts on children, among others. For a free copy of the study, contact Branch of Information Services, P.O. Box 25286, Denver, CO 80225, specify USGS report C-1225 or see <http://wa.water.usgs.gov/ps.nawqa.html>.

Seattle's Trouble with Pesticides

This national study included a coordinated effort with USGS, King County (Washington State), and the Washington State Department of Ecology in April and May, 1998, which analyzed samples from 12 streams in the Puget Sound area. As reported in the May 19, 1999 *Seattle Post-Intelligencer*, this is the time of the year when residential pesticide use peaks, so—with no surprise—the study results showed that there is a correlation between the concentration of pesticides in streams and local sales of retail pesticides. Ninety-eight chemical compounds were measured; 23 pesticides were detected in the streams, five of them at levels toxic to aquatic organisms. One pesticide detected in ALL 12 streams was diazinon, which happens to be the most frequently used insecticide on home lawns and is highly toxic to fish. Mecoprop and 2,4-D were also found in all the streams studied; both of these are also commonly used on residential lawns. Mecoprop can cause reproductive damage, and 2,4-D is a carcinogen. It is unclear how these toxins affect salmon, so the investigation for connections continues, with studies planned for all seasons of the year.

Like any responsible city would have done given all this converging research, the city of Seattle recognized its role in contributing to the endangered salmon problems, and decided to do something about it. The strategy was to request that Seattle residents reduce pesticide and fertilizer use this Spring in order to protect the local environment, and espe-

cially its salmon. Local newspapers ran ads from the City, advising citizens on "Five Things You Can Do To Save Our Salmon." The one major flaw in its approach was that the city itself continued to spray its public green space! The *Seattle Post-Intelligencer*, March 24, 1999, ran a story in which the region's transportation and parks department admit that they use herbicides regularly on parks, roadways, and planting strips. They claim that there is not enough manual labor on staff to cover the large area they must keep looking manicured and pest-free.

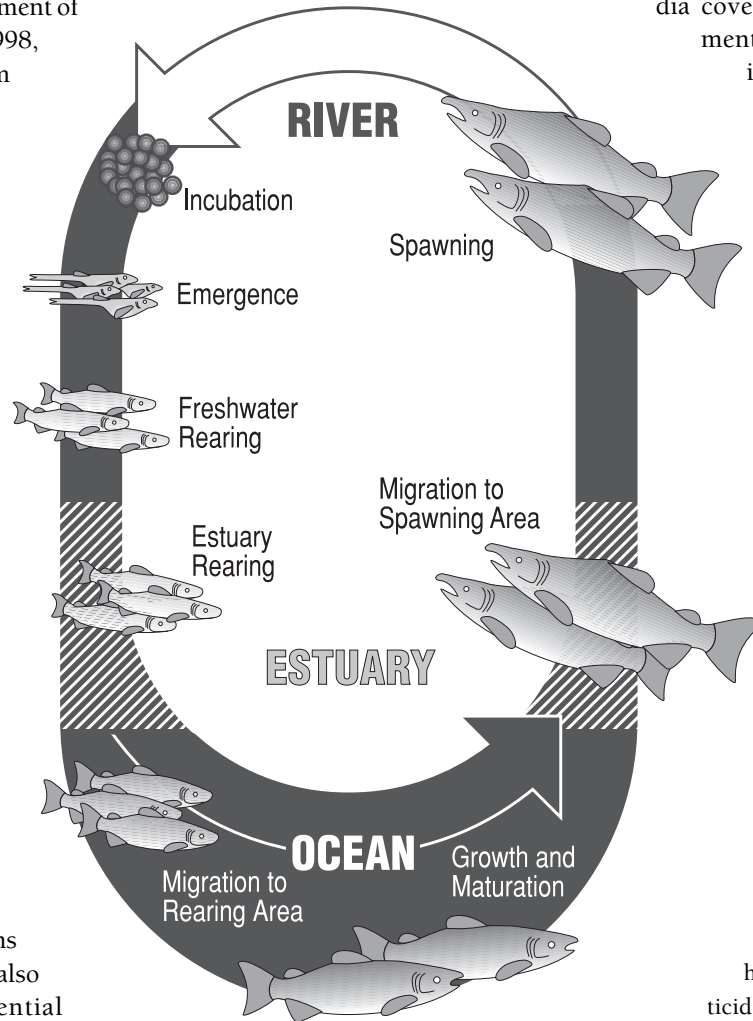
For several weeks, local newspapers were replete with debate over the issue in an attempt to assign responsibility to the various parties involved. Thanks to media coverage and urging by environmental groups such as the Washington Toxics Coalition (WTC), Mayor Paul Schell in April reaffirmed the city's commitment to reducing pesticide use and declared that the city will use reduced pesticide, "natural" lawn care at its 20 library branches and will also reduce fertilizer use. Environmental groups will be watching to see that the Mayor sticks to his decree, as city pesticide policy decisions continue to be debated throughout the summer.

Erika Schreder, director of the Pesticides Reform Project, Washington Toxics Coalition, is quoted in the *Seattle Post-Intelligencer*, as saying,

Salmon need clean water. But the new USGS study has confirmed that when pesticides are used on lawns, school grounds, roadsides, farms, etc., they don't stay put. Rather, our abundant rainfall carries them directly to the streams that we

hope salmon will call home. Let's make reducing pesticide use a priority, and show that we're willing to make changes to bring the salmon back.

For more information about pesticides and salmon, and Seattle's related actions, contact Erika Schreder, Washington Toxics Coalition, 4649 Sunnyside Avenue N, Ste 540, Seattle, WA 98103, 206-632-1545, eschreder@watoxics.org.



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