Conserving the Lifeblood of Puget Sound

We Cannot Restore the Sound Without an Accurate Stream Inventory

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In January 2007, this fish habitat was logged without any protection because of inaccurate watertype mapping. With accurate mapping, this stream would have been provided a 58-foot buffer of riparian habitat on each bank. Photo by Jamie Glasgow.

The serious challenges facing Puget Sound reach beyond its deep inlets and sinuous shorelines, all the way to the crest of the Cascades, into the rivers and streams that provide the Sound's lifeblood. The streams that flow into Puget Sound form an integral part of its physical, biological, and chemical integrity. As those streams are compromised, damaged, and even destroyed by ongoing forestry, agricultural, industrial, and development practices, the consequences flow into Puget Sound as surely as water flows downhill.

State and local agencies in Washington are charged with protecting Puget Sound's streams from adverse impacts associated with adjacent land-use activities. Most of those agencies have fallen well short of the mark for a surprisingly simple reason: they are relying on inaccurate maps.

In Washington, the responsible agencies depend on a process called water typing to identify and categorize streams, lakes, and wetlands for their importance, ecologically and for human uses. This basic inventory is the most fundamental step in conserving the health of Puget Sound and its tributaries. Where are the streams, and where are the fish habitats within them?

Unfortunately, current water typing records and maps often underestimate the actual miles of fish-bearing waters by 50% or more. Wild Fish Conservancy has documented

widespread error throughout Puget Sound in designating streams as fish-bearing or non fish-bearing. We have found that a significant number of streams in Puget Sound do not even appear on any maps. Hundreds of miles of productive aquatic habitats are being threatened and compromised because they have been misidentified and subsequently subjected to inappropriate land practices.

This has created a crisis in how development along streams is being regulated. Many streams face threats from growing development pressure, and are not receiving protection they warrant under already existing regulations. Unless the watersheds draining into Puget Sound are accurately identified and protected, cumulative effects from the development of these watersheds will continue to contribute to the compromised health of Puget Sound. And until systematic inventories are performed, regulatory maps updated, and critical areas adequately protected, progress towards salmon recovery and a healthy Puget Sound will continue to be significantly offset by the pervasive and in many cases unrecorded loss of habitat and water quality.

HOW WATER TYPING WORKS, AND DOESN'T

All cities and counties in Washington are required to designate "critical areas" and develop regulations to protect them through the implementation of Critical Areas Ordinances (CAOs). Critical areas include important fish and wildlife habitat areas, wetlands, and aquifer recharge areas. To identify streams that warrant protection as critical areas, most CAOs refer to the water type maps produced by the Washington Department of Natural Resources (WDNR).

In 1975, WDNR developed the process of water typing to regulate forest practices that impact Washington's surface waters, classifying streams into types depending on their physical, biological, and human-use characteristics. Streams that support fish are classified as Type F, and non fish-bearing streams are classified as Type Np (perennial) and Ns (seasonal). Accurate water typing is essential to protecting fish and their habitats because the type and proximity of human activities allowable in areas adjacent to streams and other surface waters is dictated by water type. For example, riparian buffer zones required on Type F streams are larger than those required on type N streams.

Several studies, including work performed by Wild Fish Conservancy, have demonstrated that WDNR's original water typing efforts underestimated the actual miles of fish-bearing streams by approximately 50% statewide. Since 1997 WDNR has maintained a system for correcting water type designations in forestlands, but there is no comparable system to ensure timely updates in non-forestry areas subject to Growth Management Act planning and regulations. Likewise, county and local planning and conservation ordinances often rely on WDNR watertype maps, and often without adequate mechanisms for checking or correcting the data presented in the maps.

Under its *Habitat Lost & Found* program, Wild Fish Conservancy has since 1994 been physically surveying streams throughout Washington to correct their misclassification and qualify them for the protection warranted under existing laws. Funded by U.S. Fish and Wildlife Service in 1994, Wild Fish Conservancy assessed water type in a randomized subsample of watersheds between the Canadian Border and the Columbia River. Since then, using the state-sanctioned watertype survey protocol we have corrected the watertype classification of nearly 6000 stream reaches statewide.

A CRISIS IN REGULATING DEVELOPMENT

Though originally designed for regulating forest practices, the WDNR water typing regulatory maps have been widely adopted by city and county government agencies for regulating development activities outside the forest-practice zones. Recent Wild Fish Conservancy watertyping surveys in rural and suburban landscapes in King, Snohomish, Jefferson, Thurston, San Juan, and Island counties documented similar error-rates in designating streams as fish-bearing or non fish-bearing, and provided evidence that many streams in these areas do not even appear on any maps. Of 19.9 stream miles surveyed by Wild Fish Conservancy within the city of Redmond during spring 2005, watertype classification upgrades were required on 18.3 miles; of those, some 6.4 miles were previously unrecorded or listed as "unknown" on WDNR watertype maps.

Consider Snyder Cove Creek. A small watershed located on Cooper Point in west Olympia, Snyder Cove Creek flows into Eld Inlet in South Puget Sound. Prior to a Wild Fish Conservancy survey, regulatory watertype maps identified the watershed as consisting of 955 feet of Type F fish habitat. After surveying the watershed in spring 2005, Wild Fish Conservancy corrected the watertype maps to better reflect reality: 4375 feet of Type F habitat and 2850 feet of Type N habitat. The regulatory map identified only 14% of the actual stream network. Unfortunately, the inaccurate stream channel mapping and the underestimated extent of fish habitat exhibited in Snyder Cove Creek regulatory map is the norm, not the exception. Without watertype assessments to correct the inaccurate regulatory maps, watersheds like Snyder Cove Creek will not be afforded adequate protection under existing regulations.

DNR Hydro

Wild fish Conservancy Hydro
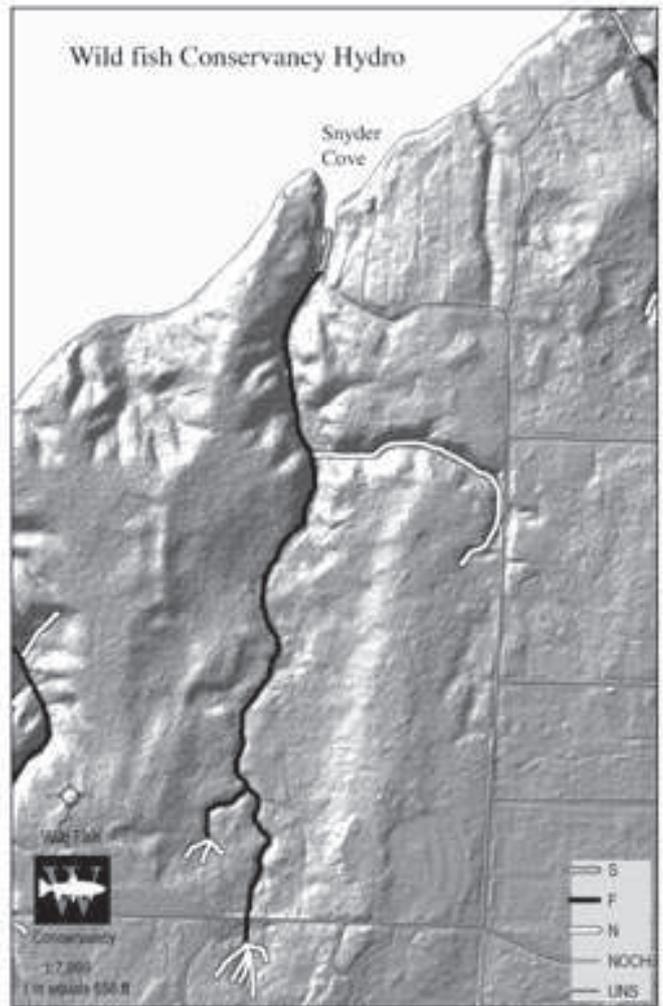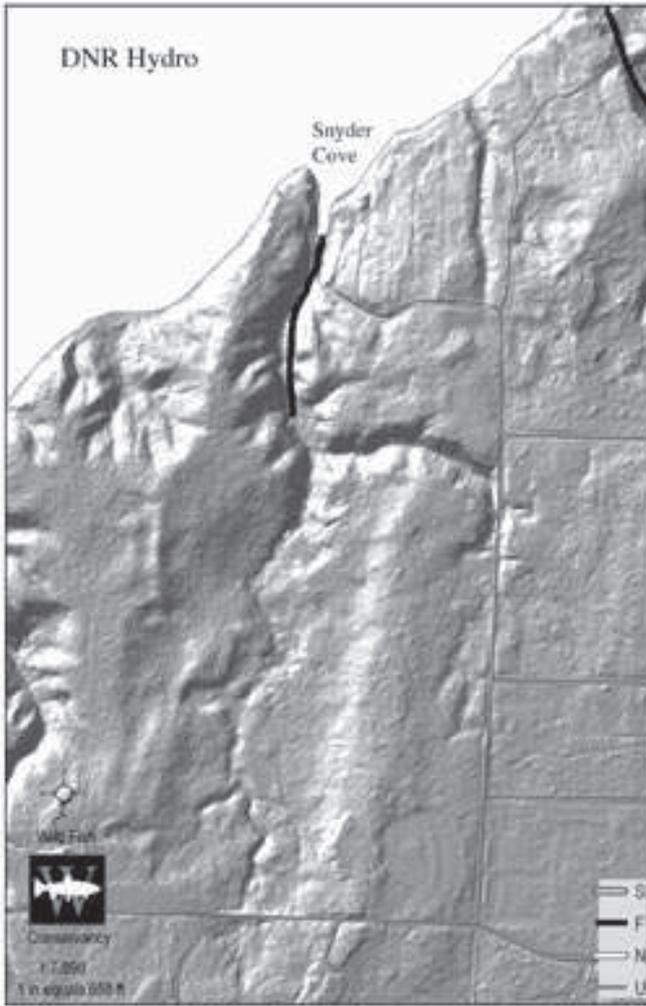
	DNR	WFC	%Increase
Stream Miles	0.2	1.4	600.0%
Fish Miles	0.2	0.8	300.0%
Non-Fish Miles	0.0	0.5	n/a

At Snyder Cove Creek in south Puget Sound, Wild Fish Conservancy surveys documented 4375 feet of Type F habitat and 2850 feet of Type N habitat. The existing regulatory map had identified just 955 feet of Type F fish habitat, only 14% of the actual stream network.

The sell-off of commercial timberlands for conversion into home sites, hobby farms, and commercial developments has accelerated suburban sprawl in ways that government officials never anticipated. The UW College of Forest Resources estimates that over the next several years 300,000 acres of forests in Washington will be converted to other uses; that's an area nearly one-third the size of Pierce County.

These factors are contributing to a crisis in Puget Sound. Development along Puget Sound's streams is occurring at unprecedented rates, and it is being inadequately regulated. Local jurisdictions are relying on inaccurate water-typing maps to regulate land and water use, and many streams and the fish they support are facing threats from development and associated practices because they are not receiving protection they legally deserve.

ACCURATE WATERTYPES ARE ESSENTIAL FOR PUGET SOUND

Misclassified Puget Sound lowland streams in areas within and bordering significant urban and suburban development are not protected from the negative impacts associated with development; the results are devastating for the streams, the fish that live in them, and the integrity of the Puget Sound nearshore habitats they feed.

When development occurs too close to streams, those watersheds suffer significant alterations to their natural hydrographs; fall and winter stormflows increase in magnitude and frequency, and summer baseflows reduce or disappear altogether. When streamside trees, plants, and grasses are removed or encroached upon, water temperatures are artificially elevated. Bank erosion, aggravated by the removal of riparian vegetation and the altered hydrograph, can cause dramatic channel downcutting that unravels stream channels and mobilizes large amounts of fine sediments. Increased impervious areas accumulate and deliver automotive, household, and industrial pollutants, channeling them into streams through stormwater infrastructure. Septic drainfields built too close to streams result in septage leaching into the stream, with subsequent ecological and human health concerns. Ultimately, sediment- and contaminant-laden stormwater is delivered to our nearshore habitats during the fall and winter, and warmer (and less) water is delivered to our nearshore habitats during the summer.

This creates a host of cascading effects. For example, toxic contamination has been identified as a primary factor contributing to the decline of Southern Resident killer whales in Puget Sound, which have been listed as endangered under the Endangered Species Act. This threat heightens the importance of cleaning up Puget Sound, and prominent among the immediate actions needed to reverse the input of toxic contaminants into Puget Sound is the control and reduction of stormwater runoff from urban and agricultural sources. This will require establishing and maintaining adequate riparian buffers on all streams and rivers within Puget Sound, effective stormwater management, and vigorous enforcement of existing laws whose purpose it is to maintain adequate buffers. But before any of that can happen, we need a consistent and accurate inventory of the region's freshwater resources.

In October 2006, fourteen of the region's most respected aquatic ecologists, geomorphologists, fisheries biologists, and professional engineers submitted an open letter to Governor Gregoire's Puget Sound Partnership in response to the Partnership's preliminary action recommendations to recover Puget Sound. The authors suggested that "end of pipe" stormwater management, status quo in the Puget lowlands, is inadequate to protect streams and Puget Sound. The authors conclude that

> "We cannot recover Puget Sound without a thorough and accurate inventory of the watersheds that feed it."

saving Puget Sound will require, among other things, widespread and immediate actions including: preserving existing least-disturbed watersheds, preserving forest cover in the Puget Sound basin, eliminating runoff from impervious surfaces, preserving existing and restoring destroyed riparian habitats, and reducing the amount of existing impervious area.

Correcting inaccurate watertype maps will help provide land-use decision agencies with the fundamental information they need for responsible protection of our watersheds.

THE GMA – AN OPPORTUNITY

All cities and counties in Washington are required to adopt critical areas regulations by the Growth Management Act. The GMA was amended in 1995 to require counties and cities to use the best available science in developing policies and development regulations to protect the functions and values of critical areas. With deadlines that vary across the state, all jurisdictions are required to review, evaluate, and, if necessary, revise their Critical Areas Ordinances to ensure that they meet GMA requirements. Given the demonstrable inaccuracies in the regulatory watertype maps that drive buffer width requirements in these local jurisdictions, it is reasonable to expect at a minimum that CAO updates will include watertype assessments and the creation of accurate fish and fish-habitat distribution maps. Unfortunately, with a few exceptions to date (notably, the City of Redmond), systematic watertype assessments are not being included in local government CAO updates.

In the meantime, the continued investment of hundreds of millions of public dollars into nearshore protection and restoration actions is more of a gesture than a means to an end. As such, it gives the public a false sense that the Sound can be saved while development continues at unsustainable rates. We will not be able to end, or even significantly slow, the pervasive loss of habitat and water quality in Puget Sound until systematic watertype inventories are performed, regulatory maps updated, and critical areas adequately protected. We will not recover Puget Sound without protecting and recovering the watersheds that feed it, and we cannot do that without a thorough and accurate inventory of those watersheds. ☚